The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXXVIII. May 14, 1938 No. 985

Disorderly Molecules

IT was a happy thought that the service of the late Mr. James Forrest to the Institution of Civil Engineers should be commemorated by an annual lecture upon the incidence of some branch of pure science upon engineering. It is a common failing of men of all professions to talk and think in the jargon of their profession, and rarely do any of us emerge from that mist of half-knowledge into the full light of complete knowledge. Those who are able to do this, whether by making acquaintance with existing knowledge or by extending the boundaries of knowledge by their own researches, invariably—when they have eyes to see—reap a great intellectual harvest. Sir Frank Smith, who in his own fluent and inimitable way took the Institution of Civil Engineers through the physical chemist's conception of molecular theory in the forty-fourth James Forrest lecture, was able to put before the members some conceptions of matter that must surely be a mental stimulus to them in their very matter-of-fact work.

In this lecture, which was entitled: "Disorderly Molecules and Refrigerating Engineering," Sir Frank Smith dealt with what to chemists are commonplace facts about the motion of molecules in gases. The emptiness of gas-filled space was brought home to the audience by showing that atoms and molecules are almost entirely composed of space, the nucleus and the electrons being separated by a distance very great compared with their size, and that the distance between molecules in a gas is ten diameters, and in a liquid or a solid approximately one diameter. A pressure of 175 atmospheres reduces the intramolecular space from ten diameters to two diameters. Molecules electro-magnetically repel or attract one another, and Boyle's Law breaks down because it is not based upon electromagnetic phenomena. Sir Frank discussed in simple language both the motions of atoms and molecules in space—the "disorderly molecules"—and the effects of electro-magnetic attraction and repulsion in relation to the distance between the molecules. He drew the curve of attraction, and the curve of repulsion between the molecules showing how these varied with the molecular distance apart, and said that the curve of the resultant was of vital interest to engineers because from it could be deduced the effect of varying the inter-molecular distance upon the strength of the material, as when determining the elasstic limit. The molecular velocity served as the basis of much of the discussion, and in particular the coincidence between the kinetic energy of the molecules and the heat content of the gas was shown to be the foundation of refrigeration work. A lucid explanation of the Joule-Thomson effect from the first principles of intra-molecular behaviour of gases was given and one is sure that those who, grasping the underlying facts of the effects of changes of pressure, and of heat content and temperature of gases must find an added interest to their subject.

To chemists and physicists these will be merely text-book matters. They are referred to here as an illustration of the value of apparently erudite and severely academic work upon our daily life. It would be hard for a layman to suppose that the motion and behaviour of molecules of gas could have any bearing upon his daily life, but Sir Frank showed that but for the studies that had been made in this field of science, our standard of living would be very much lower. As so often happens, practice preceeded the discovery of the theory, but the discovery of the underlying phenomena has assisted practice to make greater and faster headway. The first artificial ice skating rink was erected in Chelsea in 1867. The first shaft to be sunk by refrigeration was by Messrs. Siebe Gorman in 1862. Sixty-five years ago no ship had cold storage; to-day ships that carry food to us each year have 100,000,000 cu. ft. of refrigerating space, and such is the standard of living thereby rendered possible that the food we eat is independent of the season.

Sir Frank Smith explained the principle of the liquefaction of gases and of refrigeration, and he congratulated this country on its development in general refrigeration work. He declared, however, that he felt that we should be farther advanced in the practice of gas liquefaction. He declared that abroad large quantities of products were made from liquefied gaseous products obtained from the air, from coke oven gas and other sources, and that it was time that we woke up in this field of engineering. We are doubtful how far Sir Frank's rebuke and admonitions are to be meekly accepted. The foundation of an industry based on the liquefaction of coke oven gas is not so simple as appears at first sight, for economic reasons.

The activities of the merchant are of no less importance to-day than they were when free markets existed throughout the world, but Government restrictions in the form of tariffs and currency control are hampering the merchant's natural function of developing trade between one country and another.

—*J. F. A. Segner.*

Notes and Comments

Report of the B.C.D.T.A Chairman

MR. J. F. A. SEGNER, Chairman of the British Chemical and Dyestuffs Traders' Asssociation, surveyed some of the more important factors affecting the trade of the chemical merchant in his report on the work of the Association for the past year submitted to the annual general meeting of the Association on Wednesday. In the applications for additional duties under the Import Duties Act, Mr. Segner referred to three cases which the Association had successfully opposed, namely, sodium chlorate, potassium and sodium ferrocyanides, and barium chloride. Opposition was also made by the Association to an application for a specific duty on lithopone, and although the application was successful it was intimated that a reduction in the rate of duty would be considered should the leading European manufacturers come to an agreement. With improved working efficiency of the Customs, there have been fewer cases of goods delayed. Notwithstanding the better position, the Association was continuing to keep in close touch with the Customs so that should any delays occur, these could be put right with all possible speed. Mr. Segner also touched upon other difficulties which face the importer and distributor, among these being Customs valuation, and the conveyance and storage of chemicals. He pointed out that the abnormal conditions existing at the moment demanded close co-operation in every trade, and the Association was fully prepared to widen the scope of its activities, if necessary, to safeguard the interests of the chemical distributor. These and other chief points of his report are given on another page.

The New Factories Act

IT seems to be the general rule that the more important an Act of Parliament the more difficult it is to understand. The necessity for exactitude in defining the precise limits of what the Act does or does not cover, with the concomitant use of legal phraseology, greatly adds to the difficulty. The position is made more complicated when it is desired to find out the law relating to a particular subject and it is discovered that it is contained in several Acts related to one another. Until recently, the regulations relating to factories and workshops were set out in a large number of Acts, such as the Factory and Workshops Acts of 1901 and 1907, Workmen's Compensation Act, Hours of Employment (Conventions) Act, Employment of Women and Young Persons Act, and the Public Health Act. These Acts have now been consolidated and amended in the new Factories Act, 1937, which comes into operation on July 1 of this year. This consolidation has obvious advantages, but it has produced a document of formidable length which contains many important and far-reaching changes affecting all occupiers of factories.

The Factories Act Explained

A CLEAR and simple explanation of the new Act is therefore of great service to the employer. The National Confederation of Employers' Organisations has issued for sale a handbook setting out every requirement of the new Act in a readily understandable form and contrasting these requirements with the corresponding provisions of the existing law. The handbook extends to 200 pages, including an index of 30 pages, and completely covers all the aspects of the new Act. "Safety Rules for Use in Chemical Works," issued by the Association of British Chemical Manufacturers, is based on the Factory and Workshops Act, the Chemical Works Regulations, and similar enactments, together with a number of other desirable precautions which have resulted from experience. The Rules are divided into two parts; the first, entitled "Model Rules," consists of the proposed safety rules in concise form and the second "Detailed Instructions" is a more extended explanation of the objects to be attained by the Rules, the dangers arising from their non-observance and the best methods of obtaining the desired results. Part I was first issued in provisional form in 1929. The provisions of the new Factories Act and further additions and amendments as the result of subsequent experience have been incorporated in the final form of Part I which has just been issued. It is also intended to revise and complete Part II for issue at an early date. Part I comprises eight sections: general; rules for the design and operation of plant with fire and exposive risks; rules for the design and operation of plant involving risks from gas, vapour, fume or dust; rules for the design and operation of plant involving dangers from contact with corrosive or deleterious substances; rules for the design and operation of plant involving other risks; fire protection; first aid; and welfare. Useful references are given throughout to the Factories Act and other statutory regulations. The Association is prepared to supply copies to firms outside its own membership on special request. A study of these two books by the chemical employer would inform him, without undue effort on his part, not only what he is required to do under the new Act but what it is also desirable to do in the interest of safety at the works.

Annual Banquet of the Boys Hostels Association

LORD LEVERHULME will preside at the Annual Banquet of the Boys Hostels Association on May 26, to be held at the Dorchester Hotel, London. The speakers will include the Minister of Health, Sir Kingsley Wood, M.P., the Headmaster of Eton, Mr. C. A. Elliott, and Mr. Wedgwood Benn, M.P. The Association has added to its original responsibility, the John Benn Hostel in Stepney, a very much larger undertaking in King George's House, Stockwell. The number of working boys it now looks after has risen from 80 to nearly 300, and the demands on its financial resources are correspondingly greater. The boys in residence, who are all in employment, make the largest contribution possible to them, but there is a substantial deficiency in the accounts which has to be made good every year. The main purpose of the Annual Banquet is to broadcast an appeal to the generous public for support of this specially hopeful work directed to the welfare of boys between fourteen and eighteen years of age working in London, who would be without homes but for the existence of the Hostels.

The Chemical Age Lawn Tennis Tournament

AT the kind invitation of Mr. A. Van den Bergh, chairman of Van den Berghs and Jurgens, Ltd., and joint vice-chairman of Lever Brothers and Unilever, Ltd., the finals of the eighth annual CHEMICAL AGE Lawn Tennis Tournament will be held in the grounds of Mr. Van den Bergh's house, Alderbrook Park, Cranleigh, Surrey, on the afternoon of Saturday, September 3. Full particulars of the arrangements will be published at a later date.

The Function of Fillers in Rubber Compounding

By
T. L. GARNER, M.Sc., F.I.R.I.

IN compounding, there are many ingredients which have some effect on the physical properties of the mixing containing them and others which may be regarded as purely diluents. Nevertheless, there is no definite line of demarcation between the two classes of material and they are conveniently considered together. Certain ingredients such as zinc oxide and carbon blacks have been dealt with in previous articles and will not be again considered here.

Reinforced Fillers

It is only possible in many cases to decide very broadly into which subdivision, reinforcing or diluent fillers, an ingredient belongs. Variation in the properties of one particular material is often so marked, according to the particle size, as to make it possible to place it in one class or the other accordingly, but this is certainly not the case with carbon black, the most important reinforcing filler. Zinc oxide can also be classed as a reinforcing agent, but a very important ingredient, china clay, varies so widely in its characteristics that while the best grades are important in their reinforcing properties, the poor grades are little, if in any way, superior to a first-class whiting which definitely falls into the diluent class.

The importance of fine particle size in a given ingredient is often, therefore, very great and it is particularly desirable in reinforcing agents in order to secure maximum effect. Because a compound has a small particle size, however, it cannot be stated in consequence that it will be a reinforcing agent, and a typical instance is the ingredient lithopone, discussed in an earlier article, which has a smaller particle size than zinc oxide, but has a negligible reinforcing action.

Reinforcing action depends upon the intensity of the bond between the filler particle and the rubber itself, the specific material, the nature of its surface, and the degree of dispersion in the mixing all being influencing factors. Blake (*Ind. Eng. Chem.*, 20, 1,084) classed reinforcing agents as those compounds which formed a bond with rubber stronger than the matrix and diluents as those compounds which formed a bond weaker than the matrix. In the ideal state of dispersion in rubber each particle of the filler would be isolated by a rubber film from one another, and the extent to which this is possible is determined by the degree of wetting of the filler by the rubber, or the force of adhesion between the two. In the case of a poorly wetted material flocculation may occur when the rubber is in a more fluid condition, as during the early part of the vulcanisation process. Flocculated material gives hardness to the rubber, but the dispersed compound is responsible for improvement in abrasion resistance and tear. Improved dispersion can be attained by the use of suitable dispersing agents, such as for example stearic acid, and these are widely made use of, particularly in the case of carbon black and tyre tread mixings.

Magnesium Carbonate in Rubber

Magnesium carbonate is a basic carbonate of extreme bulk, but despite its whiteness it possesses no covering power in rubber, the index of refraction of the compound being very close to that of rubber. It is not used for reinforcing purposes to-day to the same extent as formerly, because it has certain objectionable characteristics; chief of these is the high permanent set which it gives to rubber compounds containing it in quantity, for example 20 parts to 100 of rubber, which gives approximately maximum reinforcing. The high set is due to the needle-shaped crystals which change position when the rubber is stretched, the bonding between rubber and filler being poor. On release of the load they become interlocked and the rubber is prevented from returning to its original position.

The usual tests carried out on magnesium carbonate are bulk, loss on ignition, moisture, sulphate as magnesium sulphate, iron and alumina, and calcium carbonate, the following being reasonable figures:—

Bulk (100 gms.)	700 c.cs.
Loss on ignition	55 per cent.
Moisture	0.5 per cent.
Sulphate as magnesium sulphate	under 1 per cent.
Iron and alumina	under 1 per cent.
Calcium carbonate	under 3 per cent.

The various grades of china clay are very widely used in rubber compound, and they not only serve as reinforcing agents, but are also used as a base for organic colours, giving extremely bright shades. The finest colloidal type of china clay, obtained by a slow flotation process, has remarkably good reinforcing properties, but as already mentioned there are poor grades with practically no reinforcing value. The tensile strength obtainable with clays is generally slightly lower than that with zinc oxide or carbon black mixings, but the replacement of zinc oxide as a reinforcing agent by china clay shows a marked saving in volume cost. In most cases zinc oxide has been replaced by a suitable grade of clay where reinforcing is required and, on account of colour, carbon black is not admissible. In using clays the rate of cure may be slightly retarded—rather higher sulphur content is required than with zinc oxide, but the resulting rubber resists overcure better than the corresponding zinc oxide mixing. Again, choice of accelerator used in mixings containing clays requires care; good results are obtained with guanidines, but accelerators of the ethylidene aniline type should be avoided.

Testing Clays

Laboratory testing of clays must include tests on a standard rubber mixing containing the clay, since the variations in the effects of various clays cannot be demonstrated satisfactorily in other ways. Tests on the mixed rubber should include covering power, physical properties on the rubber, such as tensile strength and modulus, after a suitable accelerated ageing test. Any effect of the clay on the plasticity of the unvulcanised rubber stock must be noted, or the processing of rubber in the factory may be seriously affected by changing over from one brand to another.

Glue may appear as an unusual material to include as a reinforcing agent for rubber, but nevertheless it stiffens rubber and increases the resistance to abrasive wear. In compounding it is usual to soak down the glue first until a gel is obtained and compound this into previously masticated rubber. But, because of the difficulty of maintaining uniformity, it has become customary to use master batches of rubber and glue and these are often mixed by supply firms and sold for use in the rubber trade. Glue is used particularly for such goods as soles and heels, tyre flaps, and some extruded hose stocks. It is a disperser for other compounding ingredients, and a mild accelerator of vulcanisation. Difficulty in obtaining consistent quality over a period has prevented very extended use of this material, but for low gravity, tough stocks it is still in fair demand.

Diluent Fillers

So many materials could be classed under this heading that only a few of the more important can be chosen for discussion in this article.

Whiting is by far the most important of the bulking agents used in rubber compounding and three varieties are available—chalk whiting, limestone whiting, and by-product whiting. The first of these, which occurs largely in the South of England, is of fossil origin and consists of very pure calcium carbonate. Material for the rubber industry is prepared from this by grinding and levigation. Limestone whiting is a cry-

stalline product and is purified in a similar manner, but the resulting product is not so pure as chalk whiting and is less desirable; it will usually contain more grit and also magnesia. By-product whiting is liable to contain free lime, which is objectionable and should not be allowed to exceed 0.25 per cent.

Differences Between Whitings

Chalk whiting is usually considered to be the superior variety on account of fineness, smoothness, and absence of dryness. Particles of limestone whiting are coarser, and grit present may result in low strength in the rubber. By-product whiting has a characteristic feel, the dry powder resisting rubbing, and on this account it is somewhat more difficult of incorporation into rubber. While most mixings in which whiting is used are of common type, extremely finely divided grades are now available and at least 99.9 per cent. should pass through the 200-mesh sieve on the wet test. Moisture should not exceed 0.5 per cent., and the material should dissolve 99 per cent. in dilute hydrochloric acid. The calcium carbonate content should be over 95 per cent.

Because of the extreme differences between the three grades of whiting as regards their effects on the physical properties of rubber, notably plasticity before vulcanisation, it is essential to know the type of whiting being purchased. A change from one grade to another will frequently involve mixing alterations.

Kieselguhr, known under other names such as diatomaceous earth, can be classed generally with other fillers which are essentially pure silica. It is not used to any great extent in rubber compounding and in large proportions it has a serious effect upon the elongation of the rubber. As might be expected it is particularly useful in goods which have to withstand heat and among these might be mentioned steam hose, tyre curing bags, and various packing rubbers. The usual tests are moisture content and fineness, and since the material absorbs moisture readily the former is high, often 15-17 per cent. This must be removed by the rubber manufacturer before using the compound in mixing.

Barytes occurs naturally and it is prepared for the rubber trade by grinding. It aso comes on the market as Blanc Fixe, a product of chemical origin. This filler is important because of its extreme inertness, and it has been largely used in the production of acid-resisting rubbers. The big advantage which it possesses over other acid-resisting ingredients, such as silicates and clays, is that it does not decrease the resilience and elasticity of the rubber in the same manner. While its high specific gravity, 4.50, is a disadvantage in some cases, in others it allows considerable weight to be added to rubber without excessively thinning the latter out. Barytes should contain about 98 per cent. of barium sulphate and less than 0.5 per cent. of moisture; 99.5 per cent. should pass through the 200 mesh sieve on the wet test, and the extraction with dilute hydrochloric acid should not give more than 3 per cent.

Other Fillers Utilised

There are many other fillers of less importance. French chalk, which is largely used in the rubber industry as a dusting powder and also as an impregnating medium for goods vulcanised in open steam, is used in some cases as a compounding ingredient. Even where this is not usual, it will often be the case that spent chalk used in the open vulcanisation process is used up as a filler for common goods. French chalk gives soft rubber qualities of good elongation and is also useful in ordinary mixings designed for oil resistance. Wood flour, which can now be obtained in an extremely fine divided state, is used for special classes of goods where rigidity is required and where actual strength and elongation are of secondary importance, e.g., flooring qualities. Various forms of asbestos powder are used to some extent in heat resisting mixings, such as tyre curing bags and theatre curtains, and a variety of materials such as slate powder, for example, have been made use of as fillers from time to time.

Alleged Breach of Contract

Action against Chemical Merchant Firm Fails

IN the King's Bench Division, High Court of Justice, on May 6, Mr. Justice Goddard concluded the hearing of an action by N. V. Kunstmesthandel Voorheen L. Ten Cate, of Utrecht, and Mr. J. F. Van der Wielin, of De Bilt, Holland, against the Diamond Fertiliser and Chemical Co., Ltd., of Corn Exchange Chambers, Seething Lane, London, to recover the sum of £864 alleged to be due under a judgment of the District Court of Utrecht, Holland.

Plaintiffs claimed the money alleged to be due in the alternative as damages for alleged breach of contract to supply a quantity of potash. Included in the amount was an item of 780 Dutch florins for demurrage of two lighters which conveyed the potash from Oirschot (Holland) to Ghent.

Plaintiffs' case was by a contract of August 10, 1933, it was agreed that plaintiffs would sell to defendants 600 tons, of 1,000 Kilogramme each, of potash, at the price of 42 Dutch florins per ton of 1,000 Kilogrammes, f.o.b. Ghent, to be shipped at stated periods of not less than 200 tons, that each delivery was to be treated as a separate contract and that the contract should be subject to Dutch Law. By the end of February, 1934, there had been delivered to the defendants 212,037 Kilogrammes, leaving a balance of 387,063 Kilogrammes. The plaintiffs then shipped on two lighters the balance of potash. Some three weeks later, plaintiffs alleged, the defendants wired refusing to accept this shipment, or any part of it. The plaintiffs' submission was that the defendants had wrongfully refused to accept the shipment and that in consequence they had suffered loss and had incurred liability for demurrage and other expenses.

Defendants pleaded that the contract contained the terms: "Potash 40 per cent. K_2O in good merchantable condition for fertiliser." In breach of contract the plaintiffs had tendered an extra quantity and further that the potash so presented was not in good merchantable condition, but was dirty and discoloured and contained a large proportion of hard lumps.

This the plaintiffs denied and said according to Dutch Law or commercial custom the tender by the seller of 5 per cent. more or less than the contract quantity conferred no right of rejection on the buyer.

The case was before his lordship in November last on the issue whether the judgment of the Court of Utrecht pronounced in favour of one of the plaintiffs was or was not the judgment of a court of competent jurisdiction, and on that issue his lordship found against the plaintiffs with the result that the remainder of the action now came on for trial.

His lordship said in this case the plaintiffs claimed damages for refusal by the defendants to take a large quantity of potash. The goods were inspected by defendants and they considered them unsatisfactory and suggested arbitration. The defendants never rejected the goods, though they pleaded they were unmerchantable. On the balance his lordship thought that there were some defects, but that the cargo as a whole was not unmerchantable. He could find no evidence of the commercial custom alleged, or that the plaintiffs could deliver more than the quantity. The action therefore failed and he dismissed it with costs. In the event of the case going to the Court of Appeal and they find that he was wrong, he found that plaintiffs were entitled to certain damages.

REVERSING the recent down trend, production of American iodine, as reported to the Bureau of Mines, increased in 1937 to 299,286 lb. valued at $242,422 compared with 233,925 lb. worth $212,635 in 1936. Last year's output has been exceeded in only one year, 1933, when it jumped to 401,425 lb. valued at $669,289. Imports likewise rose sharply last year, reaching a record value of 1,967,148 lb. compared with 592,217 lb. in 1936 and a previous record of 1,481,123 lb. in 1934. The value of the 1937 imports, however, was only $1,784,491, or a little over 90 cents a lb., whereas prior to 1933, when domestic production began to be important, imported iodine was valued at over $3.50 per lb.

Removal of Suspended Matter from Industrial Gases*

By
ROBERT ROGERS HARMON

THE original attempt to clean a dust-laden gas by spraying water into the gas main was soon given up because of the difficulty of removing the accumulated sludge. But from this initial attempt has arisen a variety of means, each based on a single principle or a combination of principles, for removing solids from industrial gases. These various means for collecting or otherwise removing suspended matter from gases are listed below, and a brief description of each will be given :—

A. Settling.
B. Centrifugal Force.
C. Impingement.
D. Filtration.
E. Scrubbing.
F. Electrical Precipitation.
G. Condensation.

The first and most natural step in an evolutionary development was to provide a large chamber through which the dusty gases could pass at reduced speed, thus to permit the forces of gravity to precipitate the suspended matter. The efficiencies of removal were so low, the ground area so large, and the initial cost so excessive, that, except in very special instances this method has been abandoned.

In the centrifugal arrester, or cyclone dust-catcher, the gas is made to travel in a spiral path at relatively high velocities, thereby imparting centrifugal force to the suspended particles. Such arresters are successful only where large and heavy particles of dust are to be handled, but nevertheless they find extensive use for this purpose in all industries.

Collection by Impingement

The principle of impingement involves the projection of a stream of gas, containing suspended matter, against some kind of surface, either a liquid surface or a fixed surface with a liquid or adhesive film on it, with sufficient force to propel the suspended matter into the film, by which it is retained. When properly applied, the impingement principle is of very great importance in gas cleaning. It is universally employed as a sampling method for catching all particles of matter which are detrimental to health, by projecting the sample of air or gas at high velocity against an impingement surface submerged in water. It is possible to go even further and use this principle to trap the particles which are smaller than those which may be breathed but which will not be retained by the lungs. In this case, the sample of air is rapidly expanded to effect cooling as it flows under a pressure difference through the orifice and against the impingement surface. This cooling induces condensation of water vapour on the minute particles, thereby providing the film which causes them to adhere to the impingement surface. By this means atmospheric dust counts are made.

Filtration is a combination of two effects, one being the retention of particles of matter which are larger than the openings in the medium used, the other being impingement of the particles on the fibres of the medium. While being very effective in industrial processes, fibre filters do permit the fine particles to pass through until some matter has been retained and actual filling of the openings has occurred. This increases its effectiveness as a filter, but the clogging is accompanied by an increase in resistance to the passage of the gas, and cleaning becomes necessary.

The scrubbing or washing of gases involves the intimate mingling of the gases with a liquid medium by means of sprays or jets; bubbling of the gas through the liquid; and atomisation of the liquid with gas, or beating the gas and liquid together, for the purpose of wetting the suspended particles to effect, or facilitate, their removal from the gas. Both hot and cold gases are subjected to this treatment in all of the industries, and it is, perhaps, the method most commonly employed. The degree to which the gas is cleaned is entirely dependent upon the character of the suspended matter in the gas and the character and combination of the cleaning equipment used.

Electrical Precipitation Method

The electrical precipitation method of removing suspended matter from gases is based upon the fact that all substances are susceptible of being charged, either positively or negatively, when brought into an electric field of sufficient intensity. Dust and fume particles are particularly susceptible to this electrifying action and consequently, as the gases are passed through a high potential electric field, the particles are loaded with ions which are produced by the electric discharge. The loaded particles are then urged by attractive and repellent forces toward the two electrodes, the greater number toward the positive or collecting electrode. Electrical precipitation may be classed as a primary method where gases are to be treated at elevated temperatures. As a secondary cleaner, it is more of an adjunct, as "the stage must be set" by the use of a dry collector, then a primary scrubber and cooler, to be supplemented by the precipitator unit, or units.

Basically, perhaps the most important phenomenon encountered in the purification of gas is that of condensation, because it is a contributory factor in all wet systems and now offers a means whereby the ultimate in gas cleanliness may be attained in a very simple procedure.

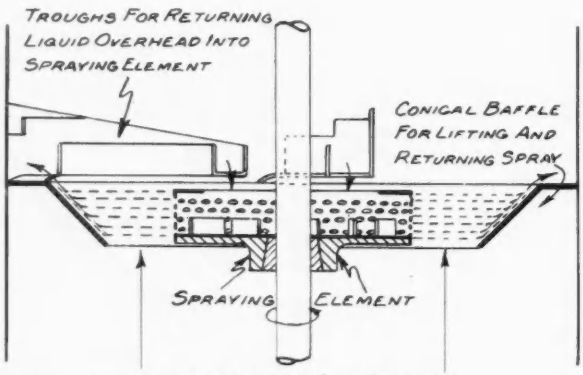
Before going further into consideration of the specific means of eliminating dusts and fumes from gases, it seems appropriate here to clarify the terms and designations applied to the suspended matter and gain some knowledge of its characteristics. The classification of suspended matter is based principally upon the size of the particles, because the size of particles is a principal factor in the degree of success obtained by the particular means employed for their elimination. There are three general classes into which suspended matter may be divided and these are :—(a) dusts, (b) fumes, (c) smokes or clouds.

Dusts may be considered as any solid particles ranging in size from 150 microns to 1 micron in dia., and are all of sufficient magnitude to settle in still air. Fumes may be either solid or liquid particles, ranging from 1 micron to 0.3 micron in dia., which settle very slowly in still air, obeying a definite law in their rate of fall. They are derived from distillation processes, smelting operations, and purely chemical reactions. Smokes or clouds may be considered as either solid or liquid particles less than 0.3 micron in dia., which do not settle at all in still air and are usually derived from incomplete combustion of carbonaceous material, such as coal oil, tar, etc. The line of demarcation between these classes is not absolutely distinct.

Nature of Gases

The nature of the gaseous medium should be considered, because it is of vital importance and determines the means to be employed in purification. Industrial gases, in the majority of cases, are to be encountered at elevated temperatures; that is, temperatures ranging from 300° F. to 1,000° F. Besides being hot, the gases carry varying quantities of water vapour which may range from 15 to 80 grains per cu. ft. of dry gas measured at 60° F.—30 in. barometer. The quantity of suspended matter, or loading, may range from 1 to 25 grains per cu. ft. of dry gas measured as above. The quantity of water vapour present per cu. ft. of gas determines the

* Abstract of a paper presented to a meeting of the Institute of Fuel on April 28.

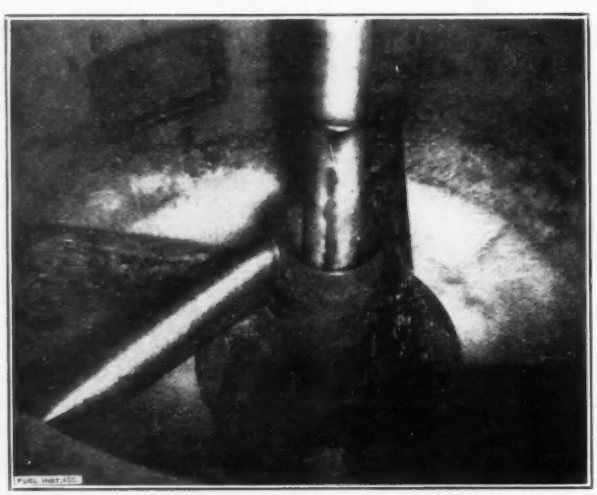


Sectional view of the Peabody rotary sprayer and elements for effecting recirculation of sprayed liquid.

dew-point of the gas. The quantity of water vapour contained in the gas possesses very great significance in all cleaning operations. Any difference in temperature between the dew-point of the gas and its actual temperature is, of course, its degree of super-heat. This factor likewise is significant, since it is a potential source of energy. It is referred to usually as sensible heat of the gas.

It may be stated as axiomatic that the ease with which suspended matter may be removed from a body of gas is a function of the size of the particle. Wittingly or unwittingly the net result attained in the high degree of cleaning of industrial gases is measured in terms of the success of the method in enlarging the finer particles by some means to make them responsive to electrical or mechanical forces that may be economically applied.

Suppose that in the cleaning system at hand, particles larger than some intermediate size, say, five unit diameters, are removable, but that it is desired to remove all the entrained particles. What is to be done? If we attempt filtration, we must use a more closely woven fabric. If intensive scrubbing is resorted to, we must enlarge the particles by driving them into drops of water, which have sufficient mass to be thrown from the gas stream. If electrostatic precipitation is employed, we must in all essentials load the little fellow with ions. This amounts to increasing its mass electrically to make it sufficiently responsive to the force of the electrostatic field established. But there is yet another means at hand, and that is to condense water vapour on the particle, thus producing a mere change of state of the gas-vapour mixture, a droplet of water containing a dust particle.



The Peabody rotor, showing spray generated by recirculation of liquid utilising principle of overhead water return.

Nearly everyone who is at all conversant with wet methods of cleaning gas recognises the necessity for water vapour in the gases, but it is safe to say that few really grasp the fundamentals of its action. What is common practice in the initial cleaning effort? In practically every case we find some sort of tower bountifully supplied with sprays, and filled with wooden grids or hurdles or baffles of some sort. The hot gas is deluged with sufficient water to cool it, without regard to water-vapour content, loss of sensible heat, or anything else. The result is that the gas is only partially cleaned. If, therefore, in common practice, further cleaning is desired, this is accomplished by subsequent apparatus, either mechanical or electrical. The water vapour that is present is practically dissipated by condensation on particles that are easily removed without the use of any water vapour at all, and few of these particles leave the gas stream because of the lack of any really intimate association between the gas, the liquid, and the cleaning elements in the equipment. As it is utterly impracticable to consider loading the particles sufficiently to expect them to precipitate against the upflowing gas currents, much of the dust that should and could be removed continues on in the gas stream. Obviously, what should be done is to order the cleaning and cooling steps in such sequence that the vapour will be condensed only in the presence of the fine particles which could not be removed by ordinary processes. There are not, in conventional practice, means for keeping the water for cooling the gas separate from that utilised for humidification and stripping, without resorting to recirculation and repumping of excessive quantities of water to the cleaner.

Peabody System-Harmon Patents

To provide means for making scrubbing efficiency practically independent of liquid throughput, and also to provide for rapid transfer of heat between the gas and the liquid, an entirely new principle for effecting a recirculation of the scrubbing medium within the scrubber itself has been developed. The sprayer element consists of a flat horizontal steel disc with a vertical perforated rim, the latter being provided with a horizontal hood, or cover, in order to force all the liquid through the perforations. This sprayer is mounted on a vertical revolving shaft. The scrubbing medium (water) is supplied to the centre of the disc, is sprayed tangentially from the rotor, or sprayer, across the gas stream and against a conical baffle attached to the shell. At the end of the spray's trajectory, sufficient momentum remains in the liquid to cause the collected spray to flow up this conical surface, into gutters which return it to the rotor. In this fashion, a relatively small volume of liquid, by recirculation within the scrubber, performs the duty which could be duplicated only by use of many times this volume of liquid, sprayed through nozzles only once before repumping. The design is simple and provides for an entirely open gas passage and approach to the spray zone. An enormous liquid surface is presented to the gas stream to provide for rapid heat transfer resulting in the transformation of the sensible heat of the gas to latent heat of water vapour. The spray is so dense that the gas is instantaneously relieved of the great bulk of dust carried by it in the raw state.

After humidification and primary stripping of the gas has been accomplished, the heat which up until now has merely been transformed from sensible into latent heat, is extracted by means of cooling water, and condensation of water vapour takes place in stages. By cooling the gas in stages, or interruptedly, the droplets formed about the dust particles are restricted to a certain size. In other words, as condensation of vapour on the dust particles occurs the droplets formed grow to a size sufficient only for removal. Thus, in each cooling stage, a certain quantity of dust particles are removed from the body of the gas before condensation proceeds. This ensures the most efficient utilisation of vapour for dust removal simply by preventing any excess or unnecessary amount of vapour from being condensed on any one class of particles. Actually, this amounts to an apportionment of vapour among

the various classes of dust and fume particles from the standpoint of size, which require wetting and loading with various quantities of water vapour for their removal. Continuous cooling, as commonly practised in conventional washers, is unavailing in the removal of finer particles, since it permits the continuous condensation of vapour on the larger particles throughout the cooling process, as no adequate means are provided for their removal from the gas stream.

To remove the small particles, which are thus wetted as vapour is condensed, requires refinement in apparatus. The impingement principle is most effective as the means for accomplishing this end. In the Peabody system, impingement is applied by using a perforated plate with the holes placed in staggered relationship. Just above the plate and at a distance approximately equal to the vena contractor, an impingement grid is placed. By this arrangement the body of the gas is subdivided into innumerable small jets, and each jet strikes an individual impact surface. With this arrangement, possitive contact and impact with a fixed surface is assured each stream of gas, yet the maximum escapement area is provided for the gas after impact.

These plates are placed horizontally in the gas-cleaning unit and are supplied with cooling water. As the gas passes upward through the perforations, it is cooled by direct contact with the water, and condensation of vapour is induced by the cooling medium surrounding the plate and grid to wet the suspended particles prior to impingement on the grid. The intimate association of gas and liquid continually washes the grid and the trapped dust and fume are carried away by the water.

Summation of Steps in Peabody Process

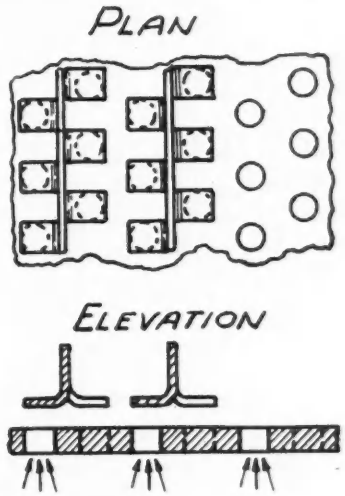
(1) Intensively scrub the gases by the action of heavy hot-water sprays to remove all solids yielding to mechanical treatment while the gases are at a temperature above their maximum theoretical dew point.

(2) Simultaneously with the scrubbing operation transform all sensible heat of the gas into latent heat by evaporation of the maximum amount of water. This is accomplished and safeguarded by recirculation of hot water through the primary stages of the scrubber, permitting ample time for complete humidification and preventing thereby any condensation of water vapour during these two operations.

(3) Regulate humidity of the gas to maintain a uniform dew point of the gas as it leaves the humidifying stages.

(4) Cool the stripped and humidified gas step by step to condense the water vapour on the residual fine particles, removing the droplets formed on the larger particles of suspended matter in succession in each cooling step to prevent subsequent unnecessary condensation of vapour upon them.

(5) Regulate the degree of cooling in each condensation stage, or, in other words, control the distribution of the condensed water vapour in the cooling stages to cause the wetting and immediate removal of the larger particles in each stage. Thus, as the gas passes from stage to stage, it becomes cleaner and cleaner. The number of steps or stages will depend upon conditions and is governed by the particular cleaning application dealt with.



The Peabody condenser plate and impingement grid baffles above each orifice.

Allegations Against Gas Undertaking

Supplies of Low Calorific Value

FOLLOWING the submission of a report on a ten days' inquiry, conducted by Mr. A. E. Baucher, barrister, of Liverpool, into allegations concerning the administration of the Southport gas undertaking, a four-hour discussion took place at Southport Town Council meeting on May 3. The Council finally decided to accept the report and a deputation is to be sent to the Board of Trade and the gas referees informing them of the inquiry and the decision of the Council to accept its findings. The deputation will report back to a joint meeting of the Gas and Finance Committees, over which the Mayor (Mr. F. Whittaker) will preside.

The inquiry was held following allegations made by four chemists employed at the Corporation gasworks, alleging among other things that the gas supplied to the town had been of a calorific value below that specified; that testing apparatus was dismantled and rendered useless at a time when it was required by a gas examiner; and that a holder of richer gas than that supplied to the consumer was prepared as occasion required for the purpose of official tests by the gas examiner. A further allegation was that gas containing sulphuretted hydrogen, at times in alarming proportions, had been supplied to the town.

In the course of his report, Mr. Baucher pointed out that the penalty for supplying gas 6 per cent. below the calorific value was on conviction £5, plus £5 for each additional one per cent. deficiency; while in regard to the sending out of sulphuretted hydrogen the penalty on conviction was £10 for each day during which such gas was continued.

There was a conflict of opinion during the discussion between the Gas and Finance Committees. Tributes to Mr. J. H. Clegg, the gas engineer, and Mr. W. E. Plevin, his deputy, were paid by the chairman and members of the Gas Committee.

The minutes of the Gas Committee, recommending what action should be taken, and those of the Finance Committee, suggesting a different course, were held over until the deputation to the Board of Trade reported back. A special meeting of the Council is to be called to deal with the matter.

The chairman of the Finance Committee (Alderman Sir Ernest Hadfield) said that if the evidence given at the inquiry was true, the Corporation owed consumers between £6,000 and £10,000, which they had paid for gas which was not of the calorific value they as a corporation were supposed to supply. He regarded it as one of the most serious things he had known since he entered the Council over twenty years ago.

The inquiry, it was stated, had cost £1,258.

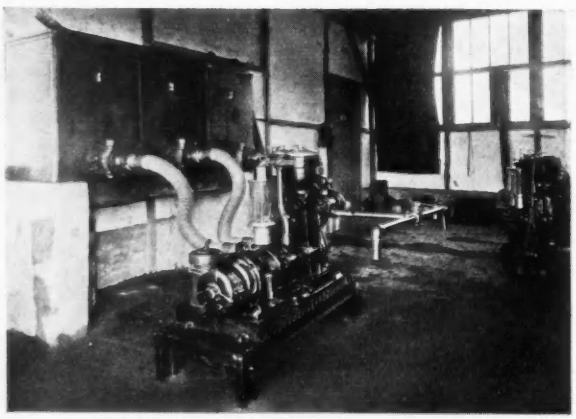
Blending Viscous Liquids

Apparatus for Continuous Mixing and Barrelling

AN interesting apparatus for the blending of viscous liquids, known as the Thiberge Autoblender, is attracting considerable interest on the Continent. It permits continuous mixing and barrelling and does away with the mixing tanks, agitators, heating installation and other equipment generally associated with this work. It is particularly applicable to the mixing of lubricating oils which are generally composed of a limited number of primary products mixed together in various proportions.

Essentially, the apparatus consists of a series of three volumetric pumps, three gauge valves on the output side of the pumps, a mixing unit, and a pump carrying the mixed oil to the barrels. Each of the three pumps used for feeding the mixer with the primary oils is identical, and all three are operated from the same shaft. They are of the positive displacement type, designed to fill completely with the primary products at each stroke, even for products with a high viscosity, such as bright stock at a temperature of 32° F.

The oil from each pump is fed to a gauge valve by which the amount of each constituent can be proportioned as desired. This valve is a rotary slide valve with one entry and



The Thiberge Autoblender under test.

two outlet ports. The slides are so arranged that as the outlet port opens the other closes, so that the combined volume delivery of the two outlet ports will always be identical with the volume intake of the inlet port. One of the two outlet streams goes to the mixer, while the other returns to the pump feed.

The oils from the three pumps fall on to a mixer plate which consists of a revolving plate near the edge of which a series of ball bearings is arranged in a race. As the primary oils fall on to the revolving plate they are thrown outwards by centrifugal force and in this way are made to pass between the ball bearings. By this means they are given a swirling motion which thoroughly mixes the constituents, without the application of heat. On leaving the revolving plate the oil falls into a sump whence it is taken by a further positive action pump to a delivery ramp. This pump is of the same size and design as the pumps providing the primary oils, but operates at a higher speed. This not only prevents the sump from being choked up when the oil is very thick, but also admits air so that the mixture as delivered by this pump is a very fine air-oil emulsion. The result of this is that the oil has a very brilliant finish, the air mixing constituting a valuable cold clarification.

The apparatus is small, being about 2 feet by 5 feet, and operates on a single 7 h.p. motor, running at about 1,450 r.p.m. The output at this speed is about 250 gallons per hour and the accuracy of proportioning is such that the error is said to be always less than ±1 per cent. Oils of a viscosity of up to 4,000° Engler can be handled.

Reckitt-Colman Amalgamation

New Operating Company to be Formed

A PRELIMINARY agreement for an amalgamation between Reckitt and Sons, Ltd., and J. and J. Colman, Ltd., was announced by the chairmen of the two companies, Sir Philip Reckitt and Sir Jeremiah Colman, at the annual meetings, held respectively in Hull and London on May 6.

It is proposed that the trading assets of both companies shall be transferred to an operating company, to be called "Reckitt and Colman, Ltd." All the shares in the new company will be held by Reckitt and Sons and J. and J. Colman, Reckitt and Sons holding a substantial majority. Fuller details of the scheme will shortly be submitted to the shareholders of the two companies at special meetings.

The board of the operating company will consist of directors nominated in an agreed proportion by the two holding companies. The first board will consist of all the directors of the two companies, and the general manager of J. and J. Colman, Mr. H. A. G. Salter, will also be offered a seat on the board.

Reckitt and Sons was registered in 1878. It manufactures starch, metal polishes, blacklead, bath cubes, "Karpol," "Harpic," "Dettol," etc. Its subsidiaries and allies include Bluebell Polish Co., London; Shinio Metal Polish Co., Liverpool; Suffolk Chemical Co.; Reckitts (Ireland); Reckitts (Overseas), at Sydney, Wellington and Montreal; Reckitts (Africa); Etablissements Reckitt, Choisy-le-Roi; N.V. Handels Maatschappij Reckitts, Amsterdam; Harpic Co., Atlantis (East); Steradent.

J. and J. Colman, of Carrow Works, Norwich, registered in 1896, manufactures mustard, starch, blue, patent barley, patent groats, Almata, Waverley oats, oatmeal, flour, Krusto, cornflour, Savora and spices.

The Blue Riband of Advertising

The Publicity Club Cup to be awarded to Sir Ernest Benn

THE Publicity Club of London, at their annual general meeting on Monday, decided by unanimous vote to award the Publicity Club Cup to Sir Ernest Benn, chief proprietor of THE CHEMICAL AGE, "for his long continued service to the advertising community."

The Publicity Club Cup is popularly known as the blue riband of advertising and is awarded every few years to some outstanding individual who has done notable work for advertising. It has been previously awarded to Major Astor, chief proprietor of *The Times*, Sir Charles Higham, the well-known advertising agent, and Sir Stephen Tallents when he was publicity officer to the Post Office.

Sir Ernest Benn was president of the Advertising Association in 1936, and led the association's delegation which visited the Northern capitals in that year.

BROMINE OUTPUT IN THE UNITED STATES

In 1937, the domestic production of bromine, as reported to the Bureau of Mines, increased to 13,100 short tons valued at $5,180,177 compared with 10,305 tons valued at $4,038,438 in 1936.

Bromine production has multiplied almost five-fold since 1932, the output then being only 2,864 tons. Commercial sources in the United States include brine wells and sea water. Increasing quantities of bromine are recovered from saltworks bitterns, but the principal supply now comes from the ocean at Kure Beach, near Wilmington, North Carolina. Sea water contains only about one pound of bromine in 2,000 gallons, but can be treated economically by modern processes and the supply is inexhaustible. The capacity of the North Carolina seaside plant was expanded again in 1937, so that in the latter half of the year it was able to recover bromine at the rate of 10,000 tons annually.

Safeguarding the Merchant's Interests

Annual Meeting and Luncheon of the British Chemical and Dyestuffs Traders' Association

THE 15th annual meeting of the British Chemical and Dyestuffs Traders' Association was held at the Waldorf Hotel, London, W.C.2, on Wednesday afternoon. The Chairman, Mr. J. F. A. Segner, gave a report of the year's work of the Association. He said that once again the Association recorded a year of progressive activity. The main work was that of voicing the collective views of its members in those matters that are of general concern, and throughout the year constant attention had been given to any developments that may affect the interests of the trade. He was pleased to report that cordial relationships have been maintained with the Government departments and other official bodies.

Changes in Import Duty Rates

Although various questions had come before the executive council for consideration, Mr. Segner confined his remarks to one or two subjects that were of greater importance to traders and distributors. He pointed out that the Safeguarding of Industries Act has now been with us for so long that there was little on which to comment in regard to its administration. Several amendments were made to the Key Industry Duty list during the past year, notably the deletion of a number of proprietary names where the chemical equivalents were already listed. A few products were added to the list, and quite a number of products have been exempted from Key Industry Duty. These changes, however, have been promptly notified to members in the Association's bulletins.

In regard to the Import Duties Act there were very few actual changes in import duty rates on chemicals and allied materials, but it is of interest to refer to the applications that were considered by the Import Duties Advisory Committee particularly those seeking additional duties. The Association opposed the additional duty applications relating to sodium chlorate and to potassium and sodium ferrocyanides and appropriate observations were made to the Advisory Committee. The former case was eventually withdrawn by the applicants and in the other application the Advisory Committee decided not to make any recommendation. Representations were also submitted in opposition to the application for increased duty on barium chloride and constructive suggestions were put forward by the Association for a settlement of the difficulty satisfactory to both sides. In this case also the Advisory Committee decided to take no action.

The plea by the home manufacturers of lithopone for a specific duty as alternative to an *ad valorem* duty was opposed on behalf of the interested members. Owing to the rising trade enjoyed by certain grades of the imported material the applicants were successful, but it is interesting to note that in making its recommendation the Advisory Committee indicated that in the event of an agreement between the chief European manufacturers they would be prepared to consider a reduction in the rate of duty. The British Chemical and Dyestuffs Traders' Association was not concerned with the merits or demerits of conventions and cartels but, as the representative body of chemical distributors, it observed with interest the present tendency to encourage international co-operation in industry as an alternative to high protective tariffs.

Improvement in Customs Administration

Continuing, Mr. Segner said he could not leave the subject of duties without a tribute to the fair and able manner in which the members of the Import Duties Advisory Committee had dealt with the many difficult cases placed before them. The views of the Association had always been received with courteous and sympathetic consideration. He then referred to the operation and administration of import duties and welcomed the opportunity to say a word in recognition of the undoubted improvement in customs administration and to record appreciation of the help that is always so readily given to the Association by the departmental officials. For many years "delay at Customs" was a source of everyday annoyance and much inconvenience to distributors and consumers. With greater efficiency in administration, however, much of this delay has been eliminated. As is known, by maintaining a close touch with the various departments of the Customs the Association, on behalf of one or another member, is frequently able to bring to an immediate and satisfactory conclusion questions that would otherwise take weeks and sometimes months to settle.

The interpretation of some of the provisions of tariff legislation is not always an easy task, and Mr. Segner said he had in mind a question that has been raised recently as to whether goods shipped from an empire port on a through bill of lading on London with an option to discharge at a continental port may be admitted to imperial preference. To those who have a knowledge and experience of trading overseas any doubt as to the answer to the question would occasion considerable surprise. From time immemorial it has been a common practice for options, for the discharge of goods at continental ports, to be stipulated on through bills of lading made out on London to enable the merchants to have a choice of markets in which to dispose of his goods while they are in course of transit. It seems a great pity that the views of an official department should cause any uncertainty to those merchants who are conducting a valuable business in this way.

Customs Valuation

Another question of concern to all traders, and which has frequently been referred to in past annual reports, is the value on which duty is assessed. With a view to safeguarding the revenue it was considered necessary by the Customs authorities to introduce a most stringent method of valuation, and traders to-day have to contend with a most complicated system which, in many instances, operates in such a manner that the importer is faced with what amounts to an unexpected additional duty. If a merchant has sufficient enterprise to obtain the sole rights to distribute the product of an overseas manufacturer or seeks to market in this country goods that have no known open market value his enterprise is penalised by being called upon to submit to a lengthy Customs investigation, which often results in the value being assessed by reference to the sales price in this country. This is a most unsatisfactory position, for it is essential that the merchant should be in a position to determine what amount of duty he will have to pay before he can fix the price at which the goods can be sold. This is a strong case for a more simplified method of Customs valuation.

The conveyance and storage of chemical materials are subjects with which all members of the Association are concerned and which are likely to receive increasing attention. Provisional draft regulations for the conveyance of dangerous goods by road were prepared some time ago by the Home Office, but have yet to be introduced. It may well be that present-day developments will necessitate the framing of new regulations considerably wider in scope, and if that should be so the British Chemical and Dyestuffs Traders' Association, as in the past, will have an opportunity to submit any representations that may be necessary.

The Association and a large number of other trade organisations criticised the Port of London Authority's proposal to seek statutory powers to register public wharfingers and uptown warehouse keepers. The opinion of the Association, however, is that a movement of this nature would set up a

monopoly that may lead to a general increase in the rates and charges for landing, warehousing and delivery of goods and it was not surprising that as a result of the widespread opposition the Port Authority decided to re-consider the proposals. Should the matter again be brought up for consideration the Association will not hesitate to voice the views of its members.

The Association's Unique Facilities

Turning to another side of the Association's activities—the service rendered to members individually—Mr. Segner pointed out that the Association provides unique facilities which enable its members to obtain prompt and dependable information on general matters and particularly on trade regulations and restrictions. The numerous and varied problems that are dealt with by the staff of the Association during the year is evidence of the increasing importance of this service. He wished to emphasise that this service is merely incidental to the main and primary objects of the Association, which are, of course, to maintain the traditional position of the chemical merchant in industry, to represent the collective views of chemical traders and to safeguard their interests as distributors in the industrial progress of the United Kingdom. He made this point because he felt that it is sometimes mistakenly thought that because a firm does not use the routine services of the Association as much as it might do there is little to be gained from membership. Every firm identified with the distribution of chemicals reaps the benefit of the work of the Association and there can be no good reason for any firm withholding its support from the representative body of the trade in which it gains its livelihood. Membership, at the present time, embraces almost 90 per cent. of the leading chemical merchant firms, but the Association needed the support of the remaining firms who could make the representation 100 per cent.

"The uncertain times through which we are passing and the rapidly changing conditions call for close co-operation in every trade and it is reassuring to know that our Association is ready, if called upon, to adapt itself to wider and perhaps hitherto unexplored fields of activity on behalf of the interests of chemical distributors," concluded Mr. Segner. "The activities of the merchant are of no less importance to-day than they were when free markets existed throughout the world, but Government restrictions in the form of tariffs and currency control are hampering the merchant's natural function of developing trade between one country and another. There are welcome indications that industry is again recognising the merchant as the proper medium for distribution in the world's markets."

The following officers were then elected: President, Mr. Victor Blagden; vice-presidents, Mr. A. F. Butler and Mr. S. J. C. Mason; chairman, Mr. J. F. A. Segner; vice-chairman, Mr. F. A. Waugh; hon. treasurer, Mr. W. Beckley; hon. auditor, Mr. B. C. Hughes; executive council, Mr. O. F. C. Bromfield, Mr. H. L. Frodsham, and Mr. G. S. Bache.

Annual Association Luncheon

The annual Association luncheon was held immediately preceding the annual meeting and was presided over by the Chairman, Mr. J. F. A. Segner.

CAPT. RT. HON. D. EUAN WALLACE, M.C., M.P., Parliamentary Secretary to the Board of Trade, in proposing the health of the Association said that the trade which the Association represented was one of great importance to the public and to British industry as a whole. The chemical trade was of very great complexity and produced thousands of products of the most varied nature. Some idea of this wide variety could be gained from the fact that the chemical products subject to key industries duty covered 365 pages of the customs and excise tariff. The industry was not only always producing new and specialised preparations, but it was constantly attempting to find new uses for the preparations which it had already put on the market. This was a formidable task. The Association, which represented the persons who carried out this task, was performing a public service of real value to the manufacturers and consumers, as well as to foreign manufacturers which they represented in many cases. The value of imports of chemicals, drugs, dyes and colours had risen from 11.6 million pounds in 1935 to 13.8 million pounds in 1937; there had also been a very substantial rise in exports.

The Dyestuffs Act of 1920 and the Safeguarding of Industries Act of 1921 marked the beginning of the relationships between the Association and the Board of Trade. These relationships had continued to the present time and were of a most cordial nature. The contact between the Government and industry had become more intimate in recent years. Much individual industrial enterprise, which is valued to so great an extent in this country, would be lost if industry became Government controlled as had happened in many countries. There was, however, need for co-operation to the best of our ability between Government and industry if we were to compete successfully with those countries where the government has taken over industry. Co-operation between the Government and industry in this country must of necessity become progressively closer in the future.

MR. VICTOR BLAGDEN, president of the Association, responding to the toast, remarked that his attention had been drawn to a statement by P.E.P. that the merchant was gradually disappearing. The Institute of Exports had taken up the cudgels on behalf of the merchant but, while P.E.P.'s statement was quite untrue, export trade had been restricted by economic nationalism, currency restrictions and international cartels. In addition, some manufacturers carried out export business not realising that the merchant could do it better. It had been said that merchants were the eyes and ears of trade. They could only fulfil that function completely when conditions once again became normal.

Finally, the chairman proposed the toast of "The Guests," to which Sir Percy Ashley, K.B.E., C.B., responded.

British Chemical Plant Manufacturers' Association

Election of Officers and Executive Committee

AT the first statutory general meeting, on May 5, of the (incorporated) British Chemical Plant Manufacturers' Association (which association has taken over the assets, liabilities and activities of the original unincorporated British Chemical Plant Manufacturers' Association), the following officers and executive committee members were elected to serve for the year 1938/1939:—Chairman, Mr. J. W. Wright (Cannon Iron Foundries, Ltd.); vice-chairman, Mr. B. L. Broadbent (Thos. Broadbent and Sons, Ltd.); honorary treasurer, Mr. W. S. Knight (Kestner Evaporator and Engineering Co., Ltd.); past-chairmen—Dr. H. J. Bush (Huntington, Herberlein and Co., Ltd.), Mr. J. H. G. Monypenny (Brown, Bayley's Steel Works, Ltd.), Mr. J. Arthur Reavell (Kestner Evaporator and Engineering Co., Ltd.), and Dr. R. Seligman (Aluminium Plant and Vessel Co., Ltd.); elected members—Mr. K. Fraser (W. J. Fraser and Co., Ltd.), Dr. G. E. Foxwell (Clayton, Son and Co., Ltd.), Mr. D. M. Henshaw (W. C. Holmes and Co., Ltd.), Mr. G. N. Hodson (Hathernware, Ltd.), Mr. A. J. S. Hooton (S. H. Johnson and Co., Ltd.), and Mr. W. Russell (Dorr-Oliver Co., Ltd.); co-opted members—Mr. J. C. Haithwaite (John Thompson (Dudley), Ltd.), Dr. R. Lessing (The Hydronyl Syndicate, Ltd.), Mr. S. J. Ralph (Aluminium Plant and Vessel Co., Ltd.), and Mr. B. N. Reavell (Lennox Foundry Co., Ltd.).

Preservatives now permitted in Norway for aerated drinks, jams and similar products, are benzoic acide, sodium benzoate and the ethyl and propyl esters of parahydroxy benzoic acid. Permissible preservatives for liquid pectin are benzoic acid, sodium benzoate and sulphur dioxide.

Personal Notes

VISCOUNT LEVERHULME and SIR FREDERICK GOWLAND HOPKINS have their portraits in this year's summer exhibition of the Royal Academy, which opened on May 2.

THE LATE MR. ROBERT CROSS, retired chemical manufacturer, of Gogar Park, Corstorphine, Edinburgh, left estate valued at £159,812.

MR. A. D. MARRIOTT, manager of the metallurgical division of the Dorr Co., Denver, United States, has been visiting the principal mining fields in Australia.

THE LATE COUNCILLOR JAMES CONSTANTINE CORT, head of the firm of D. Constantine and Son, Ltd., bleachers and finishers, Breightmet, left estate valued £20,215, with net personalty £3,850.

MR. R. A. MONTGOMERY, formerly of Hydepark Locomotive Works, Glasgow, has been appointed works manager and chief metallurgist to the newly-merged concern of Andrews Toledo, Ltd., and Darwins, Ltd., the Sheffield steel firms.

THE LATE MR. WILLIAM RHODES, of Cornaro, Monston-in-Wharfedale, Yorkshire, founder and director of Scott and Rhodes, Ltd., dyers, left estate valued £19,459, with net personalty £18,695.

SIR COLIN FRASER, chairman of directors of Electrolytic Zinc Co., of Australasia, Ltd., and Sir Alexander Stewart, a director of Commonwealth Fertilisers and Chemicals, Ltd., have been appointed members of a honorary advisory panel associated with the Australian Department of Defence for the organisation of industry in case of an emergency.

MISS MURIEL ROBERTS, B.Sc., F.I.C., superintending analyst to Liverpool Corporation, under Professor W. H. Roberts, Liverpool city analyst, and one of the public analysts for the borough of Barrow-in-Furness, has been elected president of the Liverpool Soroptomist Club. She was the first woman appointed a public analyst, and the first woman elected a member of the Society of Public Analysts, on the Council of which she served for two years, 1935-37.

MR. CHARLES F. MOORE, governing director of Swift and Company Pty., Ltd., the well-known chemical firm operating throughout Australia and New Zealand, is on his way to London. While in London Mr. Moore's address will be c/o Bank of New South Wales, Threadneedle Street, London, E.C.2. He will be in London for about three months before returning to the company's head office at Sydney via Canada and the United States.

PROFESSOR HANS GEIGER, of the University of Tübingen, has been awarded the 15th Duddell medal of the Physical Society. Professor Geiger's connection with England goes back to the days, early in this century, when as a young investigator he came to Manchester to study radioactivity under the direction of Lord Rutherford. One of the early results of this partnership was the demonstration of the possibility of detecting a single α particle by its electrical effect. The presentation of medal took place at 5.15 p.m. yesterday, at the Imperial College of Science and Technology, South Kensington, when Professor Geiger gave a short account of his recent work.

DR. W. F. K. WYNNE-JONES, of Reading University, has been appointed to the chair of chemistry at University College, Dundee, which becomes vacant on September 30, by the retirement of Professor Alexander McKenzie. As research assistant to Professor J. W. McBain, at Bristol University, Dr. Wynne-Jones carried out experimental work on the Gibbs absorption equation. In 1927-28, as holder of a Rockefeller fellowship, he worked on the problem of acids and bases under Professor J. N. Bronsted, at Copenhagen University. In 1933 he was awarded a Leverhulme fellowship, and in the laboratory of Professor H. S. Taylor, at Princeton University, he investigated the extent of the electrolytic dissociation of heavy water and the comparative rates of ionisation for hydrogen and deuterium.

MR. WALTER S. TAYLOR, of Auckland, New Zealand, has been awarded the 1938 scholarship of the North American Cyanamid Co. He will investigate the chemical reactions involved in the process of roasting flotation concentrates. The scholarship is an award of the Australasian Institute of Mining and Metallurgy.

Left: Mr. Peter F. Bennett, Chairman of Joseph Lucas, Ltd. and President of the Federation of British Industries and, right, Sir John Anderson, late Governor of Bengal, who are joining the board of Imperial Chemical Industries, Ltd.

MR. J. I. M. JONES, M.Sc., until recently technical director and chief chemist of Standfast Dyers and Printers, Ltd., Lancaster, has been appointed technical manager of British Colloids, Ltd., Park Royal, London. In 1919 Mr. Jones joined Morton's of Lancaster, on the dye manufacturing side. He has been a member of two research committees of the British Cotton Industry Research Association.

OBITUARY

MR. ARCHIBALD CAMPBELL COLQUHOUN, manager of the Carnoustie chemical works of Charles Tennant and Co., Ltd., died on May 10. He succeeded his father, Provost Dugald Colquhoun, as manager of the works.

MR. JOHN STANLEY PHILLIP, managing director of Sutton and Phillips, analytical chemists, of Stowmarket, has died at the age of 71. He had a remarkable career as an athlete and sportsman.

MR. STANLEY BROTHERHOOD, of Thornhaugh Hall, Peterborough, only surviving son of the late Mr. Peter Brotherhood, and head of the engineering firm of Peter Brotherhood, Ltd., has died at the age of 62.

MR. LAWRENCE ENNIS, until recently a vice-president of the British Iron and Steel Federation, has died in London at the age of 66. He was a director of Dorman Long and Co., Ltd., and until a few months ago had acted as managing director.

MR. E. BERTRAM WILLIAMS, a director of John E. Williams and Co., Ltd., paint manufacturers, of Partington, near Manchester, has died at the age of 60. His father, Mr. John E. Williams, was a founder of the Society of British Gas Industries.

Ten Years Back

From "The Chemical Age," May 12, 1928

Mr. William Wmdus, formerly manager and director of the Netham Chemical Works, Bristol, of the United Alkali Co., died at Bristol recently.

* * * *

European zinc producers, at a meeting at Brussels on Monday, decided to establish an organisation to collect statistics, control production, and regularise markets. The co-operation of American producers is to be invited.

References to Current Literature

Inorganic

Influence of surface active anions and cations on photographic emulsions. Lottermoser and Stendel, *Kolloid Z., 82,* 319-334.

Dehydration of acid sodium pyrophosphate. Boullé, *Compt. rend., 206,* 915-917.

Solubility of calcium carbonate in ammonium salt solutions. Emschwiller and Charlot, *Compt. rend, 206,* 1115-1117.

Complex salts. *Metallwaren Ind. u. Galvano-Techn., 36,* 183-187.

Flocculation. Samuel, *Ind. Chem., 14,* 138-140.

Organic

Reaction of cycloparaffins with aromatic hydrocarbons. Grosse and Ipatieff, *J. Org. Chem., 5,* 447-458.

Addition of hydrogen chloride to butadiene. Kharasch, Kritschevsky and Mayo, *J. Org. Chem, 5,* 489-496.

The change calcium cyanide—calcium cyanamide. Petersen and Franck, *Z. anorg. Chem., 237,* 1-37.

Polymerisation of ethylene and acetylene. Joris and Jungers, *Bull. Soc. Chim. Belg., 47,* 135-147.

Thioaldehydes and thioketones. Mitra, *J. Indian Chem. Soc., 15,* 59-64.

Acetylene in the manufacture of polyvinyl ethers. *L'Ind. Chim., 35,* 146-150.

Applications of diethyl sulphate. Brédeau, *Rev. Prod. Chim., 41,* 166-168.

Pyroabietic acid. Fleck and Palkin, *J. Amer. Chem. Soc., 60,* 921-925.

Ultracentrifugal study of gelatine. Sanijar, Krejci and Kraemer, *J. Amer. Chem. Soc., 60,* 757-763.

Analysis

Isatin β-oxime—reagent for metals. Hovorka and Sykora, *Coll. Czech. Chem. Commun., 10,* 83-92.

Determination of antimony. Pens, *Bull. Soc. Chim. Belg., 47,* 129-134.

Determination of ethylene glycol. Cuthill, *Analyst, 63,* 259-261.

Colorimetric phosphate determination in cloudy and silica-rich waters. Stoll, *Z. analyt. Chem., 112,* 1-90.

Determination of sulphur in organic compounds. Klingstedt, *Z. analyt. Chem., 112,* 101-103.

Determination of buffer salts and acidity in leather extracts. Davies, *J. Intern. Soc. Leather Trades' Chem., 22,* 181-185.

Sieving analysis. Weber and Moran, *Ind. Eng. Chem. analyt. ed., 10,* 180-184.

Microdetermination of arsenic. How, *Ind. Eng. Chem. analyt. ed., 10,* 226-232.

Mineral Oils, Gas, Tar

Utilisation of coal and the production of oil. Legrand and Simonovitch, *Fuel, 17,* 96-104.

Graphite lubricants. Denoncin, *Matières Grasses Pétrole et Dérivés, 30,* 101-103.

Bleaching earths in the mineral oil industry. Erdheim, *Petroleum Z., 34,* No. 15, 1-6.

Ageing of paraffinic and naphthenic mineral oils. Hans, *Oel u. Kohle, 14,* 321-327.

Processes of petroleum refining. Fitzgerald, *Chem. Met. Eng., 45,* 172-175.

Cellulose, Paper

Wood cellulose in the manufacture of nitrocellulose. *Z. Papier Pappe Zell. u. Holzstoff, 56,* 73-75.

Filling of digesters. Soltau, *Wack. f. Papierfabrik., 69,* 273-276.

Stabilisation of cellulose nitrates. Berl, Rueff and Carpenter, *Ind. Eng. Chem. analyt. ed., 10,* 219-224.

Bleaching, Dyeing, Finishing

Chemical finishing of cotton. Velitchkovitch, *Teintex, 3,* 223-225.

Detection of oxidation in wool. Rutherford and Harris, *Amer. Dyestuff Reporter, 27,* 179-180.

Substantivity of benzidine and similar dyestuffs. Schramek and Rümmler, *Kolloid Beihefte, 47,* 133-195.

Unlevel dyeing of wool with acid and chrome dyes. Race and others, *J. Soc. Dyers Colourists, 54,* 141-171.

Crease-resisting finishes. Wall, *Text. Manuf., 64,* 164-167.

Simultaneous dyeing and cleansing of textiles. Schöller, *Melliand Textilber. (English ed.), 19,* 102-106.

Glass, Ceramics

Luminescence of glasses. Reper, *Glastechn. Ber., 16,* 90-91.

Nickel alloys in glass working. *Verre Silicates Ind., 9,* 122-126.

Combustion efficiency of intermittent kilns. Gray, *Trans. Ceramic Soc., 37,* 100-117.

Metals, Electrometallurgy

Tests for distinguishing aluminium alloys. Zurbrügg, *Aluminium (Germany), 20,* 196-200.

Dangers in the melting of light metals. Hartig, *Metallwirtschaft, 17,* 319-320.

Reduction equilibria in the system Zn—C—O. Meunier, *Bull. Soc. Chim. Belg., 47,* 99-128.

Heat-resisting steels. Hatfield, *J. Inst. Fuel, 11,* 245-304.

Protection of aluminium alloys against atmospheric exposure. Armstrong, *Metallurgia, 17,* 219-222.

Silver plating. Wood, *Metal Ind. (U.S.A.), 36,* 166-168.

Corrosion resistance of aluminium—magnesium alloys. Bollenrath, *Metallwirtschaft, 17,* 343-353.

Tin coatings: deposition from vapour phase. Gonser and Slowter, *Metal Ind., 52,* 473-476.

Fats, Oils, Waxes

Polyene fatty acids. Baltes, *Fette u. Seifen, 45,* 196-198.

Acid purification of fats and oils. *Matières Grasses Pétrole et Dérivés, 30,* 94-95.

Free alkali in toilet, domestic and laundry soaps. Simmons, *Manuf. Perfumer, 3,* 105.

Oxidation of hydrocarbons to fatty acids, fatty alcohols and wax esters. Meyer, *Seifensieder Ztg., 65,* 215-217.

Purification of castor oil. *Seifensieder Ztg., 65,* 218-219.

Differentiation between animal and vegetable oils. Ulrich, *Paint Varnish Prod. Manager, 18,* 125.

Paints, Pigments, Resins

Chemical composition of shellac. Weinberger and Gardner, *Ind. Eng. Chem., 30,* 454-458.

Metallic soaps in the protective coatings industry. Licata, *Fed. Paint Varnish Prod. Clubs Digest,* No. 174, 128-135.

Urea formaldehyde resins for coatings. Cheetham, *Fed. Paint Varnish Prod. Clubs Digest,* No. 174, 135-141.

Nitrocellulose and nitrocellulose lacquers. Pincass, *Paint Varnish Prod. Manager, 18,* 120-124.

Testing of paints for weather resistance. Blom, *Farben Ztg., 43,* 391-393.

Paint testing. Plowman, *Oil Colour Trades J., 93,* 1245-1248.

Paint grinding. Sonsthagen, *Oil Colour Trades J., 93,* 1313-1317.

Rubber, Plastics

Oxidation products of rubber. Stevens and Popham, *J. Soc. Chem. Ind., 57,* 128-133.

Researches on rubber and rubber-like substances. Meyer, *Chem. and Ind., 57,* 439-445.

Addition of rubber to asphaltic bitumens. Fol and Plaizer, *Caoutchouc Gutta-Percha, 35,* 106-107.

Properties of celluloid. Badet, *Rev. Générale Matières Plastiques, 14,* 63-68.

Manufacture of linoleum. *Rev. Générale Matières Plastiques, 14,* 78-80.

Miscellaneous

Recovery of volatile solvents by means of active carbons. *Teint. Imp. Blanch. App., 16,* 143-149.

Tanning with lignin (sulphite cellulose) extracts. Masner and Samec, *J. Intern. Soc. Leather Trades' Chem., 22,* 154-161.

From Week to Week

ITALY HOPES TO START production of cellulose in sufficient quantities to make her self-sufficient, in October.

BRITISH INDUSTRIAL SOLVENTS, LTD., have changed their address to 21 St. James's Square, London, S.W.1. Telegrams: Aldersolv, Phone, London. Telephone: Whitehall 9561, and 8021 (sales office).

DOULTON AND CO., LTD., have published a new leaflet dealing with acid-proof stoneware pipes for chemical plant. Some interesting illustrations are given, showing stoneware pipes in unusual situations.

THE INSTITUTE OF PHYSICS has elected the following new Fellows: N. F. Astbury, A. C. Bartlett, W. G. Bird, B. S. Cooper, R. S. Edwards, R. H. Healey, F. Kohl, H. M. Parker, C. G. Pollitt, S. Rama Swamy, H. P. Rooksby, E. W. Russell, E. L. Sayce, D. O. Sproule, G. W. Warren, C. S. White, G. T. Winch.

THE BARNSTEAD STILL AND STERILISER CO. have published a new catalogue of water distilling equipment and accessories. Included are small laboratory stills, large industrial type stills, and "extra duty" stills for hard water service. In addition to the stills, storage tanks, mountings, automatic controls and cut-offs are illustrated and described.

THE TINPLATE SECTION of the Transport and General Workers' Union, representing 9,000 Welsh tinplaters, held their annual conference at Newport on May 7, when the effect of the new strip mill, which is being built by Richard Thomas and Co. at Ebbw Vale on the West Wales mills, was discussed in private from the point of view of increased production by mechanised methods.

A MEETING OF THE CO-ORDINATING COMMITTEE of the International Steel Cartel has been held in Brussels to take cognisance of the agreements reached for the renewal of the various comptoirs of the cartel, due to expire on June 30. Until recently, some fears had been entertained that there would be difficulties in renewing the agreements, but it is now understood that all difficulties have been smoothed over.

IT IS PROPOSED TO SET UP, at Government's expense, a training centre for the training of higher fire-fighting officials, in connection with which it is also proposed to set up a research centre. The Government proposes that the centre for research be attached to the Department of Scientific and Industrial Research. This announcement was made by Sir Samuel Hoare, when moving the second reading of the Fire Brigade Bill, in the House of Commons this week.

ACCORDING TO MR. G. LINDSAY-NICHOLSON, "there are enough oil-producing minerals in South Africa to produce more oil than has ever been pumped out of the oil wells of the world." He hoped to see one of the younger Dominions, like South Africa, giving a lead to the others, making oil from her natural resources. The superheated distillation process, which was the easiest and most economical method of extracting oil from coal, would soon be ready for the public to see. This process was not mentioned in the Falmouth report.

A LARGE NUMBER OF 40-GALLON DRUMS containing oil and white spirit were damaged by fire yesterday at Boyne Engineering Works, the premises of Meade-King, Robinson and Co., Ltd., oil merchants, Jack Lane, Leeds, on May 4. A serious fire also occurred at the Universal Oil Mill, Oak Road, Leeds, where 1,700 bags of stearine burned fiercely. The outbreak is believed to have been due to spontaneous combustion. The burning stearine gave off dense smoke and a number of the firemen had to use breathing apparatus.

THE WOOL DYERS' AND FINISHERS' ASSOCIATION, an organisation which embraces the smaller dyers as well as the large combines, has issued an official statement announcing an advance in wool piece-dyeing prices applying to all goods received and ordered on and after May 14. The increases amount to roughly 1d. per pound in the case of woollen and worsted dress and costume cloths and about 10 per cent. in the case of coatings, according to the type of colour required. In addition, coatings are to be charged for by weight instead of per piece.

THE 1938 ISSUE of the "Directory of Paper Makers" of Great Britain and Ireland, published by Marchant Singer and Co., (5s. 6d., post free in U.K.), has been thoroughly and authentically revised and brought up to date in all its various sections, many new additions having been made in the trade designations, also numerous withdrawals and transfers of names in both watermarks and trade names. Of particular interest is a special article "The Past Year in the Paper Trade," reviewing the position of the paper trade and important events concerning mills. In addition to full details and particulars of the paper mills, etc., alphabetical lists will be found of the principal rag merchants, paper stock dealers, waste paper merchants and china clay producers and merchants. New features include a list of members of the paper exporters' section of the London Chamber of Commerce, and a list of all the paper and allied trades associations with names and addresses of the secretaries.

DEPOSITS OF PLATINUM ORE RECENTLY DISCOVERED near Derventa, in Bosnia, have been analysed at Belgrade University, and the experts have decided that the platinum content is sufficient to justify commercial exploitation.

AFTER SOME MONTHS OF EXPERIMENTAL DRILLING for oil at Edale, Derbyshire, work has been suspended so that geological conditions may be investigated. Traces of oil have been found, but there is a doubt whether sufficient quantities are present to make continued boring worth while. Before drilling was suspended a depth of 750 feet had been reached. It is also announced that boring in the South of England—in Wiltshire, Hampshire, and Sussex—has been abandoned.

AN INTERESTING INDICATION OF THE STATE OF TRADE in viscose rayon and other viscose products in Poland is given by the report for 1937 of the Tomaszow Artificial Silk Works, the largest of the three Polish concerns which use the viscose process of manufacture. The directors state that sales during the first half of the year attained record figures, but the reaction in business experienced in all countries during the second half of the year was responsible for a material falling off, which, however, only amounted to about 24½ per cent.

THE TREASURY HAS ANNOUNCED that a 33⅓ per cent. duty will be imposed on imported pig iron as from yesterday. The Import Duties Advisory Committee, recommending the restoration of the duty, state that foreign supplies are being offered at prices below the costs of production in this country. Following the imposition of a 33⅓ per cent. duty in 1932, the committee state that the demand for pig iron was adequately met from home and Empire sources. At the beginning of 1937 demand exceeded supplies available and to facilitate purchases from foreign countries, pig iron was added to the free list on March 3 last year. Home production in 1937 amounted to 8,300,000 tons, the highest for many years, and more than double the production in any of the years 1931 to 1933.

New Companies Registered

Cloister Laboratories, Ltd. 340,046.—Private company. Capital, £100 in 100 ordinary shares of £1 each. To carry on the business of manufacturers of and dealers in chemicals, gases, drugs, medicines, toilet requisites, etc. Subscribers: Fdk. B. Lane, 87 Regent Street, W.1; David A. Lement, Registered office: Kent House, 87 Regent Street, W.1.

James Kenton, Ltd. 339,974.—Private company. Capital, £100 in 100 shares of £1 each. To carry on the business of wholesale and retail chemists and druggists, chemical engineers, sterilisers, dyers, cleaners, makers of chemical plant and materials, etc. Directors: Isadore J. Kudish, 167 Chevening Road, N.W.6; Anna L. Rees. Registered office: Dominion Buildings, 2 South Place, E.C.2.

W. K. Porteous, Ltd. 339,990.—Private company. Capital, £20,000 in 80,000 shares of 5s. each. To acquire the business of a sewage and industrial sludge disposal contractor as formerly carried on by Wm. K. Porteous, as "W. K. Porteous and Co.," at Abbey House, Victoria Street, S.W., and to carry on the business of designers, manufacturers, contractors and structural engineers for sewage and industrial sludge disposal plant, etc. Directors: Wm. K. Porteous (chairman), 6 Netherton Road, St. Margarets, Twickenham; Fdk. G. Penny. Registered office: Abbey House, Victoria Street, S.W.1.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

British India.—The Director-General, India Store Department, Belvedere Road, Lambeth, London, S.E.1, invites tenders for paint, ready mixed, 50 tons white zinc, 30 tons red roofing, etc. Tenders due May 17, 1938. Forms of tender obtainable from the above at a fee of 5s.

Burma.—A well-established firm of merchants and agents at Rangoon wishes to obtain the representation, on a consignment basis, of United Kingdom manufacturers of proprietary medicines and pharmaceutical products for Burma. (Ref. No. 325.)

Belgium:—An agent established at Borgerhout-Antwerp wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of pharmaceutical products for the whole of Belgium. (Ref. No. 334.)

France.—An agent established at Saint Mande, Seine, wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of chemicals (except dyestuffs and colours). (Ref. No. 335.)

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

MANUFACTURE OF COMPOSITIONS containing synthetic rubber-like materials.—J. G. Anderson, G. E. Scharff, and Imperial Chemical Industries, Ltd. 12178.

MANUFACTURE OF WATER-SOLUBLE UREA-FORMALDEHYDE-POLYHYDRIC ALCOHOL CONDENSATION PRODUCTS.—Beck, Koller and Co. (England), Ltd. (Beck, Koller and Co., Inc.). 12143.

TREATMENT OF OIL.—B. Blakemore. 12040.

PRODUCTION OF SOYA FLOUR, ETC.—British Arkady Co., Ltd., and A. M. Maiden. 12310.

PRODUCTION OF CHLOROPHYLL, ETC.—British Chlorophyll Co., Ltd., and B. A. Rewald. 12235.

MANUFACTURE OF VAT DYESTUFFS of the anthraquinone-acridone series.—A. Carpmael (I. G. Farbenindustrie.) 12005, 12006.

MANUFACTURE OF SULPHONIC ACID AMIDE COMPOUNDS.—A. Carpmael (I. G. Farbenindustrie.) (Aug. 29, '36.) 12629.

MANUFACTURE, ETC., OF LIGNUM PRODUCTS.—Chemische Fabrik von Heyden, A.-G. (Germany, April 24, '37.) 12330; (Germany, Dec. 27, '37.) 12331, 12332; (Germany, Jan. 21.) 12333, 12334; (Germany, Feb. 28.) 12335, 12336.

PREPARATION OF ZINC OXIDE POWDER.—Deutsche Gold-und Silber-Scheideanstalt vorm. Roessler, O. Loebich, and O. Hinderer. 12624.

MANUFACTURE OF ACETALS.—E. I. du Pont de Nemours and Co. (United States, April 21, '37.) 12038.

MANUFACTURE OF PERSULPHURIC ACID, ETC.—E. I. du Pont de Nemours and Co. 12615.

MANUFACTURE OF DERIVATIVES OF COERULEIN.—Durand and Huguenin, A.-G. (Germany, April 21, '37.) 11981.

MANUFACTURE, ETC., OF ALIMENTARY PRODUCTS.—W. U. Dykes (Ontario Research Foundation). 12349.

MANUFACTURE OF RUBBER AND SHELLAC COMPOSITIONS.—L. S. E. Ellis (Zinsser and Co., Inc.). 12121.

ALKALINE DETERGENT COMPOUNDS.—Griffith Laboratories, Inc. (United States, April 30, '37.) 11976.

PRODUCTION OF FAST DYEINGS.—W. W. Groves (I. G. Farbenindustrie.) 12083.

MANUFACTURE OF WATER-INSOLUBLE THERMOPLASTIC CONDENSATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) 12099.

APPARATUS FOR MANUFACTURING MONO-HALOGENATION PRODUCTS. W. W. Groves (I. G. Farbenindustrie.) (Sept. 25, '36.) 12233.

MANUFACTURE OF AZO-DYESTUFFS containing chromium.—W. W. Groves (I. G. Farbenindustrie.) 12461.

TREATMENT OF GOODS MADE OF REGENERATED CELLULOSE, ETC.—W. W. Groves (I. G. Farbenindustrie.) 12462.

MANUFACTURE OF WATER-SOLUBLE CELLULOSE ETHERS.—W. W. Groves (Kalle and Co., A.-G.). 12232.

MANUFACTURE, ETC., OF LUBRICATING-OILS.—I. G. Farbenindustrie. (Germany, April 24, '37.) 12385, 12386.

DYEING.—I. G. Farbenindustrie. (Germany, April 27, '37.) 12460.

MANUFACTURE OF SUBSTITUTED ANTHRAQUINONES and aroylbenzoic acids.—I. G. Farbenindustrie. (Germany, April 27, '37.) 12575.

MANUFACTURE OF DYESTUFFS of the anthrimide series.—Imperial Chemical Industries, Ltd. (United States, April 22, '37.) 12179.

MANUFACTURE OF DYESTUFFS of the anthraquinone series.—Imperial Chemical Industries, Ltd. (United States, April 22, '37.) 12180.

MANUFACTURE, ETC., OF DYESTUFFS.—G. W. Johnson (I. G. Farbenindustrie.) (April 21, '37.) 11967.

MANUFACTURE OF INTERPOLYMERISATION PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie.) 12001.

MANUFACTURE, ETC., OF VAT DYESTUFFS of the phthalocyanine series—G. W. Johnson (I. G. Farbenindustrie). 12384.

MANUFACTURE, ETC., OF ALLENE.—G. W. Johnson (I. G. Farbenindustrie.) 12497, 12498.

PRODUCTION OF POWDERS from natural, etc., silk.—R. W. Lawson, and E. E. Verdiers. 12491.

PROCESS FOR SYNTHESISING HYDROCARBONS.—Metallges, A.-G., and W. Herbert. 12397.

HYDROLYSIS OF CELLULOSIC BODIES by hydrogen halides.—E. Neu. (Aug. 9, '37.) 12089.

MANUFACTURE OF CROTONALDEHYDE.—E. Neumann, and E. J. Lush. 12253.

MANUFACTURE OF REFRACTORIES.—Oesterreichisch Amerikanische Magnesit, A.-G. (Austria, April 28, '37.) 12636.

MANUFACTURE OF RUBBER.—Raolin Corporation. (Feb. 22, '37.) (United States, March 17, '36.) 12022.

ALLOY STEEL.—Sandvikens Jernverks Aktiebolag. (Sweden, May 3, '37.) 12368.

ALLOY STEEL.—Sandvikens Jernverks Aktiebolag. (Sweden, April 30, '37.) 12369.

PREPARATION OF COMPOSITIONS containing urea-formaldehyde condensation products.—S. L. M. Saunders. 12493.

METHODS, ETC., FOR POLYMERISING OILS.—J. A. Reavell. 11955.

SEPARATION OF DIHYDROEQUILIN AND OESTRADIOL.—Schering, A.-G. (Germany, April 30, '37.) 12448.

PROCESS OF LOADING EMULSIONS of hydrocarbons with fillers. Soc. Anon. La Route, and M. Poncel. (France, May 13, '37.) 12459.

MANUFACTURE OF MOTOR FUELS.—Standard Oil Development Co. (United States, Aug. 10, '37.) 11986.

MANUFACTURE OF BITUMEN.—Standard Oil Development Co. (United States, Aug. 10, '37.) 12069.

MANUFACTURE OF ABRASIVE COATED ARTICLES.—W. J. Tennant (Carborundum Co.). 12165.

ELECTRODEPOSITION OF METALS.—W. J. Tennant (Eaton Manufacturing Co.). 12254.

HYDROLYTIC PRECIPITATION OF TITANIUM COMPOUNDS, ETC.—Titanges. (Germany, April 29, '37.) 12017; (Germany, Oct. 6, '37.) 12018; (Germany, Nov. 5, '37.) 12019; (Germany, Jan. 25.) 12020; (Germany, Jan. 28.) 12021.

MANUFACTURE OF POLYMERISATION PRODUCTS.—Dr. A. Wacker Ges. für Elektrochemische Industrie Ges. (Germany, April 28, '37.) 12576.

Specifications Open to Public Inspection

BASIC DERIVATIVES OF FATTY ACIDS and a process for their manufacture.—Chemical Works, Formerly Sandoz. Oct. 23, 1936. 28923/37.

MANUFACTURE OF CONDENSATION PRODUCTS containing nitrogen. Soc. of Chemical Industry in Basle. Oct. 24, 1936. 29106/37.

TREATMENT OF LIQUIDS with suspended particles.—E. Hiedemann and O. Brandt. Oct. 24, 1936. 29112/37.

COAGULATION OF SYNTHETIC RUBBER LATICES.—E. I. du Pont de Nemours and Co. Oct. 24, 1936. 29151/37.

COAGULATION OF COLLOIDAL DISPERSIONS.—F. I. du Pont de Nemours and Co. Oct. 24, 1936. 29152/37.

MANUFACTURE OF RUBBER.—Raolin Corporation. March 17, 1936. 12022/37.

DECIDIFICATION OF CHROME LEATHER.—I. G. Farbenindustrie. Oct. 31, 1936. 22013/37.

PESINS.—Standard Oil Development Co. Oct. 27, 1936. 24840/37.

PROCESS FOR THE MANUFACTURE OF BERYLLIUM FLUORIDE.—Seri Holding Soc. Anon. Oct. 26, 1936. 25209/37.

MANUFACTURE OF NONACARBOCYANINE DYESTUFFS.—I. G. Farbenindustrie. Oct. 29, 1936. 26824/37.

METHOD OF TREATING PULP RESIDUAL LIQUOR.—G. H. Tomlinson. Oct. 27, 1936. 27237/37.

MANUFACTURE OF ACETYL CELLULOSE.—Wacker Ges. Fur Elektrochemische Industrie, Ges., A. Oct. 27, 1936. 27714/37.

MANUFACTURE OF ESTERS OF POLYSACCHARIDES.—British Celanese, Ltd. Oct. 29, 1936. 27840/37.

PROCESS OF SEPARATION BY FLOATING, of ammonium chloride from its mixtures with alkaline salts.—Soc. D'Etudes Pour La Fabrication et L'Emploi Des Engrais Chimiques. Oct. 28, 1936. 27886/37.

PRODUCTION OF STEEL by air-refining in Thomas converters.—Ilseder Hutte (firm of), and O. Scheiblich. Oct. 27, 1936. 28164/37.

SEPARATION OF LIQUID MIXTURES.—British Celanese, Ltd. Oct. 31, 1936. 29104/37.

PRODUCTION OF GLYCERINE BY FERMENTATION.—H. Haehn. Oct. 31, 1936. 29110/37.

PRINTING AND DYEING WITH THE ESTER SALTS of leuco vat dyestuffs.—Durand and Huguenin, A.-G. Oct. 26, 1936. 29231/37.

PROCESS AND OVEN FOR THE LOW-TEMPERATURE DISTILLATION OF COAL LIGNITE and similar substances.—F. Tassara. Oct. 27, 1936. 29328/37.

MANUFACTURE OF KETENES.—E. I. du Pont de Nemours and Co. Oct. 28, 1936. 29405/37.

MANUFACTURE OF THORIUM OXIDE, and contact masses therefrom.—Chemische Fabrik Von Heyden, A.-G. Oct. 29, 1936. 29624/37.

PROCESSES FOR REFINING MINERAL AND VEGETABLE OILS and fats. J. P. Beyer. Oct. 30, 1936. 29816/37.

Specifications Accepted with Dates of Application

METAL PIGMENT PASTES AND PAINTS.—H. H. Mandle. July 25, 1935. 483,814.

MEANS FOR USE IN RECOVERING METAL CONTENTS from ore or pulp or the like.—J. Hedley, and P. M. Nash. July 23, 1936. 483,815.

BUTADIENE.—R. Hill, E. Isaacs, and Imperial Chemical Industries, Ltd. July 28, 1936. 483,989.

PRODUCTION OF POLYCARBOXYLIC ANHYDRIDES.—American Cyanamid Co. Nov. 25, 1935. 483,908.

DEWAXING MINERAL OIL.—Texaco Development Corporation. Sept. 20, 1935. 483,818.

PRODUCTION OF SYNTHETIC RESINS and the manufacture of films or sheets therefrom.—Kodak, Ltd. (Eastman Kodak Co.). July 23, 1936. 483,987.

RECOVERING SULPHURIC ACID from sulphuric acid solutions of sulphates.—O. Mantius, and E. Mantius. Nov. 22, 1935. 483,821.

MANUFACTURE OF HALOGENATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) Sept. 25, 1936. 483,823.

MANUFACTURE OF ORGANIC CONDENSATION PRODUCTS.—E. I. du Pont de Nemours and Co. Oct. 26, 1935. 483,828.

PROCESS FOR THE MANUFACTURE AND PRODUCTION OF KNOCK-STABLE GASOLINE by the destructive hydrogenation of carbonaceous materials.—H. E. Potts (International Hydrogenation Patents Co., Ltd.). Oct. 27, 1936. 484,084.

MANUFACTURE OF CHLORINATED ARTIFICIAL MASSES.—A. Carpmael (I. G. Farbenindustrie.) Oct. 27, 1936. 484,088.

PRODUCTION OF FIBROUS CELLULOSE from fibre-bearing plant stalks.—G. A. Lowry, and J. A. Grant. Oct. 28, 1936. 484,089.

ELECTROLYTIC PROCESS for the colouring of aluminium or zinc. L. T. Gmach. Oct. 28, 1936. 484,158.

PROCESS FOR THE MANUFACTURE OF MIXED SUBSTITUTED ORGANIC MERCURY COMPOUNDS.—Schering-Kahlbaum, A.-G. Oct. 28, 1935. (Samples furnished.) 484,090.

ANTHRAQUINONE DYESTUFFS.—F. Lodge, and Imperial Chemical Industries, Ltd. Oct. 28, 1936. 484,000.

MANUFACTURE OF ORGANIC GOLD COMPOUNDS.—I. G. Farbenindustrie. Oct. 30, 1935. 484,100.

MANUFACTURE OF AROMATIC ARSENIC and antimony compounds. I. G. Farbenindustrie. Nov. 9, 1935. 484,101.

TREATMENT OF MAGNESIUM or the production of magnesium alloys involving the handling of molten magnesium.—D. Gardner. Oct. 31, 1936. 483,747.

POLYMERISATION OF OLEFINES.—Standard Oil Development Co. Dec. 30, 1935. 484,170.

MAKING CUPRIFEROUS ZEOLITIC FUNGICIDES.—Permutit Co. Nov. 19, 1935. 484,115.

EXTRACTION OF OILS, fats, and other soluble constituents from materials containing the same.—Extractol Process, Ltd. Nov. 7, 1935. 484,117.

PHENOLFORMALDEHYDE CONDENSATION PRODUCTS.—Permastic, Ltd., R. A. C. Kuenzli, and G. E. Mountney. Nov. 2, 1936. 484,118.

MANUFACTURE OF COMPOUNDS of the cyclopentano-hydrophenanthrene series.—A. G. Bloxam (Soc. of Chemical Industry in Basle). Nov. 4, 1936. 483,926.

PRODUCTION OF VALUABLE HYDROCARBON PRODUCTS by the treatment with hydrogenating gases of liquid or semi-liquid carbonaceous materials.—H. E. Potts (International Hydrogenation Patents Co., Ltd.). Nov. 27, 1936. 484,127.

ELECTROLYTIC PROCESSES for the manufacture of aluminium.—D. Gardner. Dec. 4, 1936. 484,014.

TREATMENT OF BERYLLIUM ORES.—D. Gardner. Dec. 18, 1936. 483,862.

PURIFICATION OF GASEOUS MIXTURES and particularly fuel gases.—W. C. Holmes and Co., Ltd., G. P. Mitchell, and G. E. H. Keillor. Dec. 4, 1936. 483,758.

MANUFACTURE OF PAINTS.—T. Meyer. Jan. 12, 1937. 483,867.

MANUFACTURE AND PRODUCTION OF LEAD CHROMATE COLOURS containing lead molybdate.—G. W. Johnson (I. G. Farbenindustrie.) Jan. 25, 1937. 483,765.

PRODUCTION OF VALUABLE HYDROCARBON PRODUCTS from bituminous coal by destructive hydrogenation.—International Hydrogenation Patents Co., Ltd. Feb. 1, 1936. 484,132.

MANUFACTURE OF ANTHRAQUINONE DERIVATIVES.—Soc. of Chemical Industry in Basle. Feb. 19, 1936. (Samples furnished.) 483,940.

PRODUCTION OF COLOURED EFFECTS ON ALUMINIUM and aluminium alloys.—S. R. Sheppard. March 12, 1937. 483,776.

PRODUCTION OF PURE MAGNESIUM COMPOUNDS, more particularly magnesium oxide.—Ges. Zur Verwertung Chemisch-Technischer Verfahren Vaduz. May 9, 1936. 484,136.

PRODUCING DICALCIUM PHOSPHATE and calcium nitrate solution. Kunstdunger-Patent-Verwertungs-A.-G. June 13, 1936. 484,037.

RUBBER COMPOUND.—United States Rubber Products, Inc. June 10, 1936. 483,786.

PROCESS FOR THE MANUFACTURE OF DYESTUFFS of the anthraquinone series.—Chemical Works, formerly Sandoz. June 16, 1937. (Addition to 457,386.) (Convention date not granted.) 483,950.

PRODUCTION OF A STABLE, water-soluble medicament from the latex of lactuca virosa.—Knoll, A.-G., Chemische Fabrieken. June 23, 1936. 483,789.

METHOD AND APPARATUS FOR DESTRUCTIVE DISTILLATION at low temperature.—H. E. G. Rowley (Soc. Chimique de la Grande Paroisse-Azote and Produits Chimiques). July 12, 1937. 484,050.

APPARATUS FOR THE ELECTROLYTIC DECOMPOSITION OF LIQUIDS.—L. Schirmer. July 22, 1937. 484,054.

PURIFICATION OF LIQUID SEWAGE.—E. Maier. July 29, 1936. 483,954.

CARBOXYLATION OF ALKALI METAL SALTS of phenols.—Calco Chemical Co., Inc. April 29, 1937. 483,795.

LUBRICATING-OILS.—Standard Oil Development Co. Sept. 22, 1936. 483,796.

INCREASING THE RESISTANCE TO CORROSION of light metals.—Magnesium Elektron, Ltd. Sept. 25, 1936. 483,798.

PRODUCTION OF PULP from highly-resinous woods.—R. Niethammer (trading as Kubler and Niethammer Chemische Fabrik Coswig-Anhalt Ges.), and K. Schwabe. Sept. 20, 1937. 483,964.

MANUFACTURE OF SHEET CELLULOSIC MATERIAL.—British Cellophane, Ltd. Oct. 22, 1936. 484,069.

RECOVERY OF CARBON DISULPHIDE from industrial effluent waters.—Carbo-Norit-Union-Verwaltungs Ges. Jan. 28, 1937. 483,974.

TREATMENT OF MAGNESIUM or the production of magnesium alloys, involving the handling of molten magnesium.—D. Gardner. Oct. 31, 1936. 483,813.

Chemical and Allied Stocks and Shares

ALTHOUGH the industrial and allied sections of the Stock Exchange have again shown an inactive appearance, they were reported to be firmer than a week ago. Sentiment was assisted to some extent by the better trend of Wall Street markets, and by indications that tension in European politics is gradually easing. Shares of companies identified with the chemical and allied industries showed numerous individual features of interest, but movements in prices were somewhat irregular in character. Imperial Chemical were more active, and at 31s. 6d. are within a few pence of the price current a week ago, while Distillers have recovered further from 94s. 6d. to 96s. on the belief that there are reasonable prospects of the dividend again being brought up to 22½ per cent. for the year. Turner and Newall, at 81s. 10½d., show a moderate decline on balance, pending the interim dividend announcement, but Lever and Unilever ordinary units have been an active market up to the higher level of 38s. British Aluminium were steady at the moderately higher price of 52s. 9d., while B. Laporte, although inactive, have retained their recent rise to 95s. in advance of the dividend announcement.

Goodlass Wall and Lead Industries ordinary shares are little changed at 10s., the full results having created a good impression as the market had been anticipating lower profits in view of the sharp fluctuations in the price of lead shown last year. Pinchin Johnson and other paint shares had a fairly steady appearance. Wall Paper Manufacturers' deferred units gained a few pence to 39s. 3d.

On the other hand, Boots Drug 5s. shares were weak, and declined from 47s. 6d. to 40s. 7½d. xb, the market having been disappointed by the moderate decline in the past year's profits. Beechams Pills are lower at 57s. 6d., but are now "ex" the increased final dividend. Eno Proprietaries are also lower on balance at 5s. 4½d. Timothy Whites and Taylors, at 26s. 9d., have lost their improvement of the previous week, but British Drug Houses, at 23s. 9d., were again well maintained. Fison, Packard and Prentice were also unchanged at 34s. 4½d., as were Cooper, McDougall and Robertson at 29s. 4½d. United Molasses had a steadier appearance around 28s. 3d., awaiting the interim dividend announcement. Reckitt and Sons ordinary shares have made the higher price of 106s. 3d. on the amalgamation proposed with J. and J. Colman, and the shares of the latter company were very firm at 74s. Cerebos were higher at £8¼.

General Refractories were a few pence lower at 16s. 9d. awaiting the results and Imperial Smelting also moved down moderately, sentiment in regard to the shares of the last-named company being influenced by fears in the market whether they will remain in the dividend list as it is being assumed that the lower price of zinc may be affecting earnings. British Plaster Board gained 1s. 3d. to 27s. 3d. on the possibility that the distribution on these 5s. shares may again be brought up to 50 per cent. British Glues were again around 5s. 7½d., and British Industrial Plastics continued to transfer actively around 2s. 3d. Greeff Chemicals Holdings 5s. units were steady at 7s. 6d. under the influence of the past year's results. Monsanto Chemicals 5½ per cent. preference shares were again quoted at 22s. 6d.

Iron, steel and similar shares were less active, and rather lower prices have ruled for Dorman Long, Consett Iron and United Steel. On the other hand, Stewarts and Lloyds have responded to the large increase in the past year's profits, although best prices were not held. Richard Thomas remained dull, pending the dividend announcement, which is expected next month. The market is continuing to take the view that the completion of the company's Ebbw Vale works may require additional capital. Staveley Coal and Iron were lowered by 1s. 3d. to 52s. 3d., following the news of the Markham Colliery disaster.

Oil shares have made better prices in response to favourable estimates of impending dividends.

Weekly Prices of British Chemical Products

TRADE in the chemical markets during the past week has been on a rather moderate scale and there is still room for improvement in the volume of inquiries for new business. Consumers are apparently able to absorb their contract commitments and deliveries have been going forward promptly and in fairly substantial quantities. Tartaric, citric and acetic acids are all enjoying a better inquiry due to seasonal influences. There are no important price changes to record and values throughout the market are steady. Most of the coal tar products continue to be neglected and market conditions are decidedly dull. Prices on the whole are inclined to be a little weaker, but quotations are mostly nominal.

Price Changes

Falls: Calcium Acetate, brown (Manchester); Pyridine (Manchester); Benzol, crude (Manchester); Carbolic Acid, crude (Manchester).

MANCHESTER.—New business in chemicals on the Manchester market during the past week has continued rather quiet, and bookings have, for the most part, been in respect of prompt or near delivery positions, and have not covered very important quantities in the aggregate. Chemicals for the textile and allied industries both in Lancashire and Yorkshire are being called for against contracts in only relatively moderate quantities, and the position in this respect is not too satisfactory in a number of other using industries. With one or two exceptions, however, prices maintain a steady tone. Extremely dull trading has again been reported in most sections of the by-products market and in several cases quotations have further eased to a slight extent.

GLASGOW.—There has been a steady day-to-day demand for general chemicals for home trade during the week, but export inquiry has been very limited. Prices generally continue quite steady at about previous figures, with no actual changes to report.

General Chemicals

ACETONE.—£45 to £47 per ton.

ACETIC ACID.—Tech, 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. **MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.**

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; **GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.**

ALUMINIUM SULPHATE.—£7 2s. 6d. per ton d/d Lancs. GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. **SCOTLAND: 10½d. to 1s. 0½d., containers extra and returnable.**

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising, £19 per ton, ex wharf.

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM DICHROMATE.—8½d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. **MANCHESTER: White powdered Cornish, £16 10s. per ton, ex store.**

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £11 10s. per ton.

BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, special terms for contracts. **SCOTLAND: £9 per ton net ex store.**

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. **GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.**

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. **GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.**

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 3½d. per lb. d/d station in 70-lb. cylinders (1-ton lots).

CHROMETAN.—Crystals, 2½d. per lb.; liquor, £19 10s. per ton d/d. station in drums. **GLASGOW: 70/75% solid, £5 15s. per ton net ex store.**

CHROMIC ACID.—10d. per lb., less 2½%; d/d U.K.

CHROMIUM OXIDE.—11d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0¼d. per lb. **MANCHESTER: 1s. 0¼d. SCOTLAND:** B.P. crystals, 1s. 0¼d. per lb.; less 5%, ex store.

COPPER SULPHATE.—£21 7s. 6d. per ton, less 2% in casks. MANCHESTER: £18 10s. per ton f.o.b. SCOTLAND: £19 10s. per ton, less 5%, Liverpool, in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £4 2s. 6d. to £5 2s. 6d. per cwt. according to quantity; in drums, £3 15s. 0d. to £4 7s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 4d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. GLASGOW: White crystals, £31; brown, £1 per ton less. **MANCHESTER:** White, £32; brown, £31.

LEAD, NITRATE.—£32 per ton for 1-ton lots.

LEAD, RED.—£31 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. **SCOTLAND: £31 per ton, less 2½% carriage paid for 2-ton lots.**

LITHARGE.—SCOTLAND: Ground, £31 per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—SCOTLAND: £7 10s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 10d. per lb.; powder B.P., 6s. 0d.; bichloride B.P. (corros. sub.) 5s. 1d.; powder B.P. 4s. 9d.; chloride B.P. (calomel), 5s. 10d.; red oxide cryst. (red precip.), 6s. 11d.; levig. 6s. 5d.; yellow oxide B.P. 6s. 3d.; persulphate white B.P.C., 6s. 0d.; sulphide black (hyd. sulph. cum sulph. 50%), 5s. 11d. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—Spot, £25 to £30 per ton according to strength, quantity and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £54 per ton ex store.

PARAFFIN WAX.—SCOTLAND: 3¾d. per lb.

POTASH CAUSTIC.—Solid, £35 5s to £40 per ton according to quantity, ex store; broken, £42 per ton. **MANCHESTER: £38 10s.**

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4¼d. per lb. MANCHESTER: £37 10s. per ton.

POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. SCOTLAND: 5¼d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 5s. 6d. per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9¾d. per lb. SCOTLAND: B.P. Crystals, 9¾d. MANCHESTER: B.P. 10¾d. to 1s.

POTASSIUM PRUSSIATE.—6¼d. per lb. SCOTLAND: 7d. net, in casks, ex store. MANCHESTER: Yellow, 6½d. to 6¾d.

SALAMMONIAC.—Firsts lump, spot, £42 17s. 6d. per ton, d/d address in barrels. Dog-tooth crystals, £36 per ton; fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

SALT CAKE.—Unground, spot, £3 11s. per ton.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, 13s. 10s. per ton d/d station. SCOTLAND: Powdered 98/99%, £26 10s. in drums, £19 5s. in casks, Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£19-£20 per ton carriage paid North. GLASGOW: £18 10s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 15s. per ton d/d station in bags. GLASGOW: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. MANCHESTER: £10 10s.

SODIUM BISULPHITE POWDER.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.

SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

SODIUM CHLORATE.—£27 10s. to £32 per ton. GLASGOW: £1 11s. per cwt., minimum 3 cwt. lots.

SODIUM DICHROMATE.—Crystals cake and powder 4½d. per lb. net d/d U.K. with rebates for contracts. MANCHESTER:

SODIUM CHROMATE.—4½d. per lb. d/d U.K.

4d. per lb. GLASGOW: 4¼d. net, carriage paid.

SODIUM HYPOSULPHITE.—Pea crystals, £15 5s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.

SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.

SODIUM NITRATE.—Refined, £8 per ton for 6-ton lots d/d. GLASGOW: £1 12s. 0d. per cwt. in 1-cwt kegs, net, ex store.

SODIUM NITRITE.—£18 5s. per ton for ton lots.

SODIUM PERBORATE.—10%, 9½d. per lb. d/d in 1-cwt. drums.

SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £15 to £16 per ton delivered per ton lots.

SODIUM PRUSSIATE.—5d. per lb. for ton lots. GLASGOW: 5d. to 5¾d. ex store. MANCHESTER: 4½d. to 5¼d.

SODIUM SILICATE.—£8 2s. 6d. per ton.

SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.

SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 12s. 6d.

SODIUM SULPHIDE.—Solid 60/62%. Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.

SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.

SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.

TARTARIC ACID.—1s. 1½d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1½d. per lb. GLASGOW: 1s. 1d. per lb., 5%, ex store.

ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARYTES.—£6 to £6 10s. per ton, according to quality.

CADMIUM SULPHIDE.—4s. 9d. to 5s. per lb.

CARBON BLACK.—4d. per lb., ex store.

CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.

CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.

CHROMIUM OXIDE.—Green, 10½d. to 11d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

INDIA-RUBBER SUBSTITUTES.—White, 4½d. to 5½d. per lb.; dark 4d. to 4½d. per lb.

LAMP BLACK.—£24 to £26 per ton del., according to quantity. Vegetable black, £35 per ton upwards.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE.—Spot, 30%, £16 10s. per ton, 2-ton lots d/d in bags.

SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.

VERMILION.—Pale, or deep, 4s. 9d. per lb., 1-cwt. lots.

ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1938: November, £7 8s.; December, £7 9s. 6d.; January, 1938, £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.

CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1938: November, £7 10s.; December, £7 11s. 3d.; January, 1938, £7 12s. 6d.; February, £7 13s. 9d.; March, £7 15s.; April/June, £7 16s. 3d.

NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1938.

SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1938.

CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.

AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 10d. to 10½d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d.; pure, 1s. 8½d. to 1s. 9d. GLASGOW: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4½d. MANCHESTER: Pure, 1s. 7d. to 1s. 8d. per gal.; crude, 11½d. per gal.

CARBOLIC ACID.—Crystals, 7¾d. to 8¼d. per lb., small quantities would be dearer; Crude, 60's, 3s. 0d. to 3s. 3d.; dehydrated, 4s. 4½d. to 4s. 7½d. per gal. MANCHESTER: Crystals, 7½d. per lb. f.o.b. in drums; crude, 3s. to 3s. 3d. per gal.

CREOSOTE.—Home trade, 5½d. per gal., f.o.r. makers' works; exports, 6¾d. to 6¾d. per gal., according to grade MANCHESTER: 4½d. to 5¾d. GLASGOW: B.S.I. Specification, 6d. to 6½d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5¾d. to 6½d.

CRESYLIC ACID.—97/99%, 2s. 2d. to 2s. 5d.; 99/100%, 4s. to 5s. 6d. per gal., according to specification; Pale, 99/100%, 2s. 6d. to 2s. 9d.; Dark, 95%, 1s. 10d. to 2s. per gal. GLASGOW: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification. 3s. 9d. to 4s. MANCHESTER: Pale, 99/100%, 3s.

NAPHTHA.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1d. to 1s. 3d. per gal., naked at works, according to quantity. GLASGOW: Crude, 6½d. to 7¼d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.

NAPHTHALENE.—Crude, whizzed or hot pressed, £5 5s. to £6 5s. per ton; purified crystals, £14 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £5 10s. to £7 per ton. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined, £15 per ton f.o.b.

PITCH.—Medium, soft, 33s. per ton, f.o.b. MANCHESTER: 32s. 6d. f.o.b., East Coast. GLASGOW: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.

PYRIDINE.—90/140%, 13s. 6d. to 15s. per gal.; 90/160%, 10s. 6d. to 13s. 3d. per gal.; 90/180%, 3s. 3d. to 4s. per gal. f.o.b. GLASGOW: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. MANCHESTER: 10s. to 12s. per gal.

TOLUOL.—90%, 1s. 10d. per gal.; pure, 2s. 2d. GLASGOW: 90%, 120, 1s. 10d. to 2s. 1d. per gal.

XYLOL.—Commercial, 1s. 11d. to 2s. per gal.; pure, 2s. 3d. to 2s. 3½d. GLASGOW: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £7 10s. to £8 per ton; grey, £9 10s. to £10. MANCHESTER: Brown, £9; grey, £11 10s.

METHYL ACETONE.—40.50%, £35 to £40 per ton.

WOOD CREOSOTE.—Unrefined, 4d. to 6d. per gal., according to boiling range.

WOOD NAPHTHA, MISCIBLE.—3s. 3d. to 3s. 6d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.

WOOD TAR.—£2 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZIDINE, HCl.—2s. 7½d. per lb., 100% as base, in casks.

BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11½d. per lb. d/d buyer's works.

m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.

p-CRESOL, 34·5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.

DICHLORANILINE.—2s. 1½d. to 2s. 5½d. per lb.

DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.

DINITROBENZENE.—8½d. per lb.

DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.

DINITROTOLUENE.—48/50° C., 9½d. per lb.; 66/68° C., 11d.

DIPHENYLAMINE.—Spot, 2s. 2d. per lb., d/d buyer's works.

GAMMA ACID, Spot, 4s. 4½d. per lb. 100% d/d buyer's works.

H ACID.—Spot, 2s. 7d. per lb.; 100% d/d buyer's works.

NAPHTHIONIC ACID.—1s. 10d. per lb.

β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.

α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.

β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.

NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.

o-NITRANILINE.—4s. 3½d per lb.

m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 10d. to 2s. 3½d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.

NITRONAPHTHALENE.—10½d. per lb.; P.G., 1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.

SULPHANILIC ACID.—Spot, 8½d. per lb. 100%, d/d buyer's works.

o-TOLUIDINE.—11½d. per lb., in 8/10-cwt. drums, drums extra.

p-TOLUIDINE.—2s. per lb., in casks.

m-XYLIDINE ACETATE.—4s. 8d. per lb., 100%.

Company News

A. Boake Roberts and Co. announce an interim of 1 per cent., tax free (same).

Reckitt and Sons, Ltd., have announced the usual quarterly payment of 5 per cent., less tax, on the £3,648,000 ordinary capital. For many years past, three quarterly interims of 5 per cent. have been distributed, followed by a final of 6½ per cent. and a bonus of 1½ per cent.

Eno Proprietaries, in their report for 1937, show that profits fell from £210,724 to £186,535. This year a sum of £17,000 is transferred from income tax reserve no longer required, making a total of £203,535. Income tax and N.D.C. absorbs £50,153, compared with £52,401. As already announced, a final dividend of 7 per cent. brings the total for the year to 11 per cent., a decrease of 2 per cent. compared with the 1936 payment. A sum of £6,872 is placed to reserve for foreign assets and contingencies, £10,000 to advertising reserve for subsidiaries, and £3,268 to reserve for depreciation of British Corporation stocks. The carry-forward (subject to preference dividend accrued for quarter to December 31) is up from £32,529 to £43,426. Meeting, Hotel Victoria, W.C.2, May 26, at 12 noon.

Goodlass Wall and Lead Industries, Ltd., earned a profit of £266,569, in 1937, compared with £275,082 in the previous year. While the dividends received from subsidiaries engaged in the lead trade in this country were somewhat reduced, says the report, this reduction was partly offset by improved results from other sources, in particular some of the associated undertakings abroad. A transfer of £25,000 is again made to general reserve, and the reserve for staff pensions receives a further £7,500. A profit of £71,129 on the sale of special lead stocks has also been placed to general reserve, raising this fund to £238,937. As already announced, the ordinary payment is unchanged at 7 per cent., and the carry forward is increased from £78,661 to £82,938. Meeting, Winchester House, E.C.2, May 19, at 2.30 p.m.

Stewarts and Lloyds, Ltd., show a remarkable jump in profits in their 1937 accounts. Trading profit is £2,506,882, more than £1,100,000 up on the 1936 figure of £1,392,310, while the net profit (before tax) is £1,056,519 higher at £1,929,314. The 1937 figure is, after allowing a larger amount for normal depreciation—£373,581, against £318,802. In addition, £250,000, compared with £100,000, is set aside for special depreciation and £300,000, against nil, is placed to stock reserve. Provision for tax and N.D.C. is more than doubled at £550,000. As already announced, the dividend on the deferred stock is stepped up from 7½ per cent. to 12½ per cent. —the biggest dividend since 1924. The 1937 dividend is payable on a larger deferred capital—£5,669,650, including the 1,042,910 £1 shares issued at a premium to holders in December, 1936. The amount carried forward is virtually unchanged at £170,159.

British Oxygen Co. show further expansion in 1937. The consolidated profit of the organisation has increased from £995,781 to £1,160,181, and after deducting depreciation of fixed assets and amounts written off cylinders, the balance of profit of the organisation is £823,887, compared with £694,372. The company's proportion of profits retained by subsidiary companies is £21,119 higher at £115,212, leaving a profit (including profits of subsidiaries to the extent of dividends declared) of £708,675, compared with £600,279. The parent company's profit and loss account shows that £27,500 has been provided for N.D.C., and after reserving £100,000, against £50,000, for tax, and contributing to pensions funds, net profits amount to £585,245—an increase of £64,293. As already announced, the year's dividend on the £2,841,252 of ordinary stock is 17 per cent., less tax. For the previous year an interim of 7 per cent. was paid on £2,485,674 of ordinary capital and was followed by a scrip bonus of 6⅔ per cent., which ranked for the final dividend of 8 per cent.

Forthcoming Events

London.

May 17.—The Institution of Chemical Engineers. Joint Meeting with the Institution of Mechanical Engineers, Storey's Gate, Westminster. 6 p.m. Dr. J. H. Dobson and Professor W. J. Walker, "The Improvement of Atmospheric Air Conditions in Deep and Humid Mines."

May 19.—The Chemical Society, Burlington House, Piccadilly, W.1. 8 p.m. Discussion opened by Professor G. M. Bennett, "Organic Intermolecular Complexes."

May 23-25.—Rubber Technology Conference. Institution of the Rubber Industry. Hotel Victoria, Northumberland Avenue, W.C.2.

May 25.—Electrodepositors' Technical Society. Spring Meeting. Annual Election. Northampton Polytechnic Institute, Clerkenwell, E.C.1. 8.15 p.m. S. Field, Sixth Wm. James Memorial Lecture.

May 25—27.—National Safety Congress. Caxton Hall. 25th Annual Dinner. Park Lane.

Droitwich.

May 18-21.—Society of Glass Technology. Fifth Glass Convention.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

AVIS FERTILISER CO., LTD., W. (M., 14/5/38.) May 3, series of £10,000 debentures with a premium of 5 per cent., inclusive of £2,000 already registered, present issue £50; general charge. *£1,500. March 25, 1937.

BETTELL, LTD., London, S.W., analytical chemists, etc. (M., 14/5/38.) April 28, £250 debenture to A. N. Watney, Folkestone; general charge.

BRITISH EMULSIFIERS, LTD., Hanworth. (M., 14/5/38.) April 27, mortgage to National Provincial Bank, Ltd., securing all moneys due or to become due to the Bank; charged on land and buildings at Hampton Road, Hanworth. *Nil. January 14, 1938.

DENHAM LABORATORIES, LTD. (M., 14/5/38.) April 25, agreement securing £3,400 and further advances, to F. G. Control Co., Ltd.; general charge (subject to, etc.). *£63,742. July 22, 1937.

F. LEROY AND CO. (MANCHESTER), LTD., manufacturers of heat-resisting composition, etc. (M., 14/5/38.) April 25, £5,000 debentures; general charge.

GLUCOSE AND BY-PRODUCTS, LTD., London, E.C. (M., 14/5/38.) May 3, £16,000 debentures; general charge. *—. December 31, 1937.

JARROW METAL INDUSTRIES, LTD., London, E.C. (M., 14/5/38.) May 3, £40,000 debenture, to H.M. Treasury Solicitor; general charge.

RICHARD THOMAS AND CO., LTD., London, W.C., steel, tinplate manufacturers. (M., 14/5/38.) May 3, debenture to Lloyds Bank, Ltd., securing all moneys due or to become due to the Bank; charged on stock in trade, raw and partly manufactured materials, work in progress, book debts, etc., and other current trading assets of the company both present and future, and ranking in priority to floating charge created by Trust Deed dated June 30, 1937. *£7,000,000. July 29, 1937.

STANDARD PULVERISED FUEL CO., LTD., London, W.C. (M., 14/5/38.) April 27, £4,000 debentures, part of £42,000 already registered. *Nil. January 5, 1938.

WESSEX METAL AND CHEMICAL CO., LTD., Westbury (Wilts.). (M., 14/5/38.) May 2, debenture to Lloyds Bank, Ltd., securing all moneys due or to become due to the Bank; general charge.

Satisfaction

DEHYDRATION, LTD., London, S.W. (M.S., 14/5/38.) Satisfaction April 30, of mortgage registered May 4, 1937.

County Court Judgments

BEAUTEX, LTD., R/O, Bradley Hall, Bradley Road, Station Road, Wood Green, manufacturing chemists. (C.C., 14/5/38.) £27 2s. 7d. April 4.

WOODBROOK DRUG AND TOILET CO. (sued as a firm), 53 Graiseley Street, Wolverhampton, manufacturing chemists. (C.C., 14/5/38.) £12 16s. 2d. April 6.

Declaration of Solvency Filed

GELATEX (GREAT BRITAIN), LTD., London, E.C., manufacturers of synthetic resins, etc. (D.S.F., 14/5/38.) May 2.

Companies Winding-up

DIXON SOAP CO., LTD. (C.W.U., 14/5/38.) Winding-up Order, May 2, 1938.

TUDOR LABORATORIES, LTD. (C.W.U., 14/5/38.) Winding-up Order, May 2, 1938.

Receiverships

CARMAC LABORATORIES, LTD., 163 High Street, Hampton Hill, Middlesex. S. R. C. Sumpter, 18a Broadway Chambers, W.6, was appointed receiver and manager on April 27, 1938, under powers contained in debenture dated December 17, 1937.

Books Received

Scientific Encyclopædia. Van Nostrand. London: Chapman and Hall, Ltd. Pp. 1,234. 50s.

Explosives, Matches and Fireworks. By Joseph Reilly. London: Gurney & Jackson. Pp. 172. 7s. 6d.

Feuerfeste Baustoffe. By Dr. Phil. Claus Koeppel. Leipzig: Verlag Von S. Hirzel. Pp. 296. 15.50 RM.